

On The Notion of Theme Vowel: A New Approach to Catalan Verbal Morphology

by

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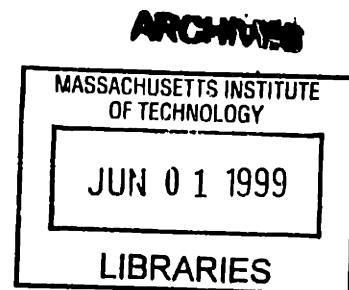
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ABSTRACT

This thesis discusses the internal constituent structure of the Catalan verbal forms, focussing on the investigation of three *a priori* unrelated issues that have remained unexplained in previous analyses: the allomorphy of the theme vowel, the allomorphy of the inflectional affixes and the cases of syncretism found across and within tenses. I develop a unified account of all of these facts within the framework of Distributed Morphology (Halle & Marantz (1993) and related work) that results from a new syntactic approach to the nature and function of the theme vowel.

The analysis consists of two main claims closely interrelated by the crucial role played by the theme vowel in both. First, I argue that the Catalan verbal system is organized in terms of markedness. The Catalan verbal conjugations are reanalyzed as complexes of abstract binary features that are hierarchically interrelated according to their degree of markedness. Second, I propose that the traditional theme vowel must be understood as the realization of a morphological well-formedness requirement on a functional head *v*. Crucially, I extend this requirement to all syntactic functional heads. This means that a given verbal form might have multiple theme vowels, as many as there are functional heads in the syntactic structure that correspond to single terminal nodes in the morphology. It is argued that this new functional-head-related notion of theme vowel serves to signal, in the morphology, the category 'verb' created in the syntax, thus providing empirical support for Marantz's (1997, 1999a, b) proposal that "the syntactic categories N, V, A are morphological categories created by the syntax."

This syntactic approach to Catalan verbal morphology has significant implications for the entire morphophonology of Catalan. First, it is shown that stress for verbs is fully predictable and results from the application of a single rule. Furthermore, I argue that stress in the nominal environment is mainly the result of the same process. In addition, it is shown that the application of the well-formedness requirement on functional heads unifies two as yet unrelated notions: verbal theme vowels and nominal class markers.

Thesis Supervisor: Dr. Alec P. Marantz

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I started working on the verbal morphology of Catalan in September 1998 for my Generals Paper and since then many people have helped me in one way or another at different stages of this work.

Among all of them, the guidance of two very special people has been crucial in the development of this thesis: Alec Marantz, my official supervisor, and Morris Halle, my unofficial mentor.

Morris has influenced my work since the very beginning, when I only had a bunch of puzzling data. In our almost weekly meetings during the first months, he helped me make sense of them, while he was teaching me how to do morphology, how to do phonology, how to do linguistics. I really regret not having met him before, during my first year. My deepest thanks, Morris.

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Although I have not worked with Jim Harris, he read the two previous drafts of this present work. His skepticism about my proposal for the unification of theme vowels with class markers provided me with extra motivation to work out a solution which my intuitions told me was correct. His early skepticism turned into obvious approval in the form of his (1999) paper where he fully adopts my analysis. This was a fine reward for much hard work on my part.

Among all the members of the Linguistics Department a very special group of seven people deserves my warmest thanks, my classmates, Ling-97, for so many things that cannot be listed: Karlos Arregi, Paul Elbourne, Elissa Flagg, Michela Ippolito, Julie Legate, Liina Pytkäinen and Andrea Rackowski. I'll miss you!

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1. Introduction

This thesis is primarily concerned with the internal constituent structure of Catalan verbs. The main goals of the paper are to provide some insights into the internal organization of the Catalan verbal system, and to shed light on the true nature of the entities that constitute its forms. In order to do this, only simple tenses and non-finite simple forms will be considered. However, I have chosen to exclude the imperative forms and to include a simple past form (*Preterit Perfet Simple*, here called Simple Past (SP)), that is mainly used in written Catalan.¹ The reason for this choice is that in the imperative, only a dozen verbs can be said to show true imperative morphology, all of which are irregular verbs. The rest alternate in a regular way between indicative and subjunctive morphology. Although this is a very interesting case of syncretism that could shed some light on the Catalan verbal system, it would lead me too far afield from the main purposes of this paper. Hence, I leave this issue for further research.² On the other hand, Simple Past shows special past perfect morphology, and it is included for the sake of completeness in covering simple verbal forms. With these preliminaries in mind, we can now start by stating the problems posed by the Catalan data, and by providing an overview of how we can account for them.

1.1. The Puzzles

It is a well-known fact about Romance that verbs are idiosyncratically classified as belonging to a particular conjugation class. This classification is based on the so-called *theme vowel*. In Catalan, there are three different conjugation classes,³ as shown in (1).^{4,5}

- (1) (a) Class I: verbs taking –a–: *cant-a-nt* [kənt-'a-nt] 'singing'

¹ This holds for the standard dialect, Central Catalan, the one that is the primary object of study of the present paper. Other dialects, such as Valencian or Ibizan, use it in spoken language (cf. Veny (1993)).

² See Harris (1998) for an account of Spanish imperatives within Distributed Morphology. It must be noted, however, that Catalan imperatives are crucially distinct from Spanish: second person imperative forms in Spanish have special imperative morphology, while their Catalan counterparts do not, except for irregular verbs.

³ The third conjugation is assumed to be internally divided in two. This division goes back to the Catalan Grammar of Fabra (1912), and has been traditionally accepted. I will discuss this issue in section 4.3 below.

⁴ Here and throughout the paper I will provide broad phonetic transcriptions. For a detailed description and analysis of the phonology of Catalan, I refer the reader to Mascaró (1983), Bonet & Lloret (1998) and references cited therein.

⁵ I illustrate the different classes with the gerund forms, where each conjugation takes its corresponding theme vowel.

- (b) Class II: verbs taking –e-: *tem-e-nt* [təm-'e-nt] 'fearing'⁶
- (c) Class IIIa: verbs taking –i-: *un-i-nt* [un-'i-nt] 'joining'
- IIIb: verbs taking –i-: *surt-i-nt* [surt-'i-nt] 'going out'

It must be noted that this theme vowel is not invariable. It may have different allomorphs, it may be absent in some forms, or it may even surface as the theme vowel characteristic of another conjugation. Crucially, the choice of a particular theme allomorph is conditioned by the following tense and agreement suffixes, as shown in Table 1 and illustrated with the examples in (3) (allomorphs are shaded). Descriptively, in (3(a)), the theme vowel is determined by both the tense morpheme and the Agr morpheme. In (3(b)), it is determined by the tense morpheme alone. We can not understand this in terms of cyclicity; that is, material added in a later cycle seems to determine the selection of some element in a previous cycle. This leads to a cyclicity problem that any theory should be able to avoid in a principled way.

(2) Table 1: Theme Vowel Allomorphy (adapted from Mascaró (1986:110))^{7, 8}

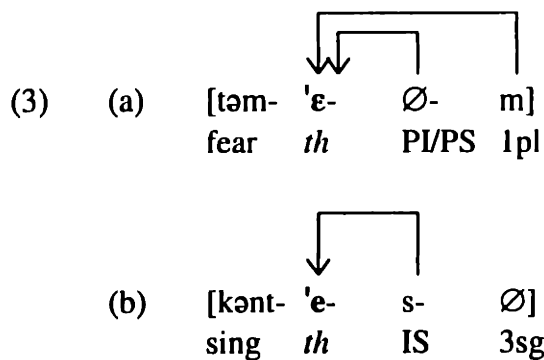
Tense	Agr	I	II	IIIb	IIIa
PI / PS	sg, 3pl	Ø	Ø	Ø	'ɛʃ
	1pl, 2pl	'ɛ	'ɛ	'i	'i
IS	all	'e	'e	'i	'i
F / C	all	'a	Ø	'i	'i
II	all	'a	'i	'i	'i
SP	1sg	'i	'i	'i	'i
	rest	'a	'e	'i	'i
INF		'a	Ø	'i	'i
G		'a	'e	'i	'i
P		'a	'u	'i	'i

⁶ The second conjugation has a great number of irregular verbs. Many verbs show root allomorphy, and in some cases, the choice of the theme vowel is not /e/, but /ɛ/, as in /pud'ɛ-r/ 'be able' or /sab'ɛ-r/ 'know'. I will put aside the irregular forms and concentrate on developing a better understanding of the generalizations underlying the Catalan verbal system.

⁷ Throughout, I will be using the following abbreviations:

PI, Present Indicative; PS, Present Subjunctive; II, Imperfect Indicative; IS, Imperfect Subjunctive; SP, Simple Past; F, Future; C, Conditional; INF, Infinitive; G, Gerund; P, Participle

⁸ I will later assume the Person features proposed in Halle (1997:429), [±Participant] and [±Author]. However, I will use 1, 2, and 3 person throughout the discussion for ease of reference.



Apart from the cyclicity problem, several other issues arise when looking at Table 1. The third conjugation is divided into two conjugations on the basis of a single morpheme, *-'εf-*,⁹ that appears in certain forms of a single tense, namely, the present. This division fails to capture the fact that precisely in those forms, the other conjugations show a /Ø/ allomorph, i.e., they pattern together with the *IIIb* forms. This brings us to another question: are all the zero-morphemes instances of true Ø-morphemes? A further issue is that the second conjugation patterns in some cases with the first, in others with the third, and in others has its own allomorphs. Is this an accident? Can we explain the behavior of the second conjugation on more general grounds? On the other hand, the third conjugation never takes the theme vowel of another conjugation, while the first seems to do so at least in two cases.¹⁰ Is this another accident? All these questions lead to a more general one, namely, what is the nature and function of the theme vowel?

Another puzzle is raised by the inflectional suffixes. Consider Table 2, also adapted from Mascaró (1986:111).

⁹ I will assume following Mascaró (1983, 1986), that the suffix *-εf-* is a theme. Despite the fact that *-εf-* is not a vowel, I will refer to all members of Table 1 as *theme vowels*, *-εf-* included.

¹⁰ See the discussion below for the meaning of 'at least'.

(4) Table 2: Tense/Aspect Morphemes

Agr	Tense/Aspect						
	PI	II	SP	PS	IS	F	C
1sg	u	bə / ə	Ø	i	s	r'e	r'iə
2sg	ə / Ø	bə / ə	rə	i	si	r'a	r'iə
3sg	ə / Ø	bə / ə	Ø	i	s	r'a	r'iə
1,2pl	Ø	bə / ə	rə	Ø	si	r'ε	r'iə
3pl	ə	bə / ə	rə	i	si	r'a	r'iə

Here, too, we are faced with a cyclicity problem. As shown in Table 2, some tense morphemes vary according to the agreement morphemes, as in the PI, SP, PS, IS and F. Others vary according to the conjugation, as in the II and in the PI. In still others, as in the PI, the tense morpheme may vary according to both conjugation *and* agreement features. In addition to cyclicity issues, many other questions arise. For instance, the inflectional affixes for first and second person plural always pattern together. They also select the same theme allomorphs, as shown in Table 1 above. Is this mere coincidence? Also, we see in Table 2 that a phonetic schwa is present in different tense morphemes, and as listed, this is a mere accident. But is it truly so? Or, are the schwas related in some way? Another issue concerns stress. Theme vowels in Table 1, and future and conditional endings in Table 2, are stressed, while the other inflectional morphemes are unstressed. By representing verbal endings as belonging to separate and unrelated paradigms, we fail to advance towards a unified picture of the verbal system. Moreover, such a representation presumes that the task of the child is to learn each form on a case by case basis.

There is yet another issue, namely, the cases of syncretism that we find throughout the verbal system.¹¹ Thus, there are cases of *total syncretism*, as illustrated in (5) and (6), but also cases of what we could call *partial syncretism* or, in other words, correlations in the inflectional endings across tenses, given in (7) and (8) below.

(5) (a) 1pl PI: [kənt-'ε-m] [təm-'ε-m] [un-'i-m]

¹¹ As I mentioned above, I will not be concerned with the cases of syncretism that we find in the imperative.

- | | | | | | |
|-----|-----|------------|----------------|----------------|--------------------|
| | (b) | 1pl PS: | [kənt-'ɛ-m] | [təm-'ɛ-m] | [un-'i-m] |
| (6) | (a) | 1sg IS: | [kənt-'e-s] | [təm-'e-s] | [un-'i-s] |
| | (b) | 3sg IS: | [kənt-'e-s] | [təm-'e-s] | [un-'i-s] |
| (7) | (a) | 2sg C: | [un-i-r-'iəs] | [təm-ə-r-'iəs] | [kənt-ə-r-'iəs] |
| | (b) | 2sg IS: | [un-'iəs] | [təm-'iəs] | but: [kənt-'a-bəs] |
| (8) | (a) | 1pl F: | [kənt-ə-r-'ɛm] | [təm-ə-r-'ɛm] | [surt-i-r-'ɛm] |
| | (b) | 1pl PI/PS: | [kənt-'ɛm] | [təm-'ɛm] | but: [surt-'im] |

In this paper, I propose a unified account of these three *a priori* unrelated issues that have remained unexplained in previous approaches: theme allomorphy, inflection allomorphy and cases of syncretism. It will be shown that all these facts are not mere accidents; rather, they follow from general properties of the grammar of Catalan. Concretely, they follow from a new approach to the notion of the theme vowel, which will have far-reaching implications for the entire morphophonology of Catalan (and of other Romance languages as well).

1.2. Proposal: The Global Picture

I present an analysis of Catalan verbs within the framework of Distributed Morphology (DM), as proposed in Halle & Marantz (1993, 1994) and much related work.

To give a brief sketch of the architecture of the framework, in this syntactic approach to morphology, the syntactic terminal nodes are complexes of syntactic and semantic features, here called *morphemes*, selected by each particular language from a UG alphabet of features. After the operations of the computational system, the syntactic structures enter into the morphology where morphological processes may further modify them before *Vocabulary Insertion* (VI) supplies the terminal nodes with phonological features¹² (*Late Insertion of underspecified Vocabulary items*). Morphological operations may *merge*, *fuse* or *fission* terminal nodes, and may add or delete (*impoverish*) features or feature complexes. Crucially, all these operations are constrained by strict syntactic locality conditions (government relations and strict adjacency). In addition, VI is a

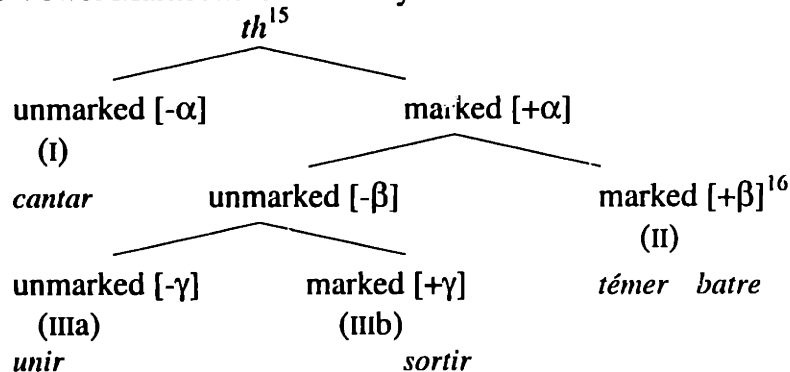
¹² Later it will be shown that these operations may apply cyclically, interacting with VI.

competition-based operation, subject to the *Subset Principle* (Halle 1997:428), according to which the phonological exponent of a Vocabulary item is inserted if it is the most highly specified item that matches all or a subset of the grammatical features specified in the terminal node.

The core of my proposal can be reduced to the answer to a single question, namely, what is the nature and function of the theme vowel? The claim is that we will not be able to achieve a full account of the internal organization of the verbal system of Catalan (as well as that of other Romance languages) unless we first correct and improve our understanding of the notion of theme vowel. My analysis consists of two main points closely interrelated by the crucial role played by this entity.

First, I argue that the Catalan verbal system is internally organized in terms of markedness. The different conjugations, i.e. the phonological exponents of the conjugations, are reanalyzed as bundles of binary features. These features are hierarchically interrelated according to their degree of markedness. For Catalan, I propose the *Markedness Hierarchy* of the theme vowel as depicted in (9).^{13, 14}

(9) Theme Vowel Markedness Hierarchy



¹³ This *Markedness Hierarchy* might resemble Davis' (1991) classification of the Spanish conjugations. However, the very basic conception and function of the hierarchy in (9) has no resemblance at all to Davis'.

¹⁴ I will be using the abstract labels [α, β, γ]. I leave the discussion on the nature of these primitive features for further research.

¹⁵ This must be understood as a mere label that stands for 'theme position.' This will become clear below in the discussion.

¹⁶ It is possible and even likely that this node must be split into two like the [-β] node, to account for the differences between second conjugation verbs, as shown in (i). As I mentioned in footnote 6, the second conjugation displays many irregularities. I will leave them for future research.

- | | | | | | |
|-----|----|-----------|--------------|------------|----------------------------|
| (i) | a. | [səb'ent] | [pud'ent] | [bul'ent] | [əb'ent] |
| | | 'knowing' | 'being able' | 'wanting' | 'having'(auxiliary 'have') |
| | b. | [təm'ent] | [kur'ent] | [krəʃ'ent] | |
| | | 'fearing' | 'running' | 'growing' | |

The interpretation of this hierarchy will be crucial for the understanding of the Catalan verbal system in general, and of the theme allomorphy in particular. Given the set of Vocabulary items proposed in (10) below, I claim that the theme allomorphy shown in Table 1 is the result of the interaction of the *Markedness Hierarchy* in (9) above with the degree of markedness of the environment, which is determined by the Tense morpheme, i.e. the tense features. This interaction is instantiated by the set of rules given in (11)-(12). It is important to note that all of these rules can be subsumed under a single process that affects the degree of markedness of the theme vowel in a given context.

(10) Theme¹⁷

- (a) /u/ ↔ [+β] / ____ [+Participle, +Past]
 /Ø/ ↔ [+β] / ____ [+Future]
 /e/ ↔ [+β] / <elsewhere>
- (b) /ɛʃ/ ↔ [-γ] / ____ [-Past]
 /i/ ↔ [+α] / <elsewhere>
- (c) /ɛ/ ↔ [-α] / ____ [+Part, +Plural]
 /a/ ↔ [-α] / <elsewhere>

(11) Feature-filling rules (feature addition)

- (a) [] → [+α] / [Fut] ____ [+Past] (C)
- (b) [] → [+α] / [+Subj] ____ (PS & IS)
- (c) [] → [+β] / ____ [+Past, +Subj] (IS)

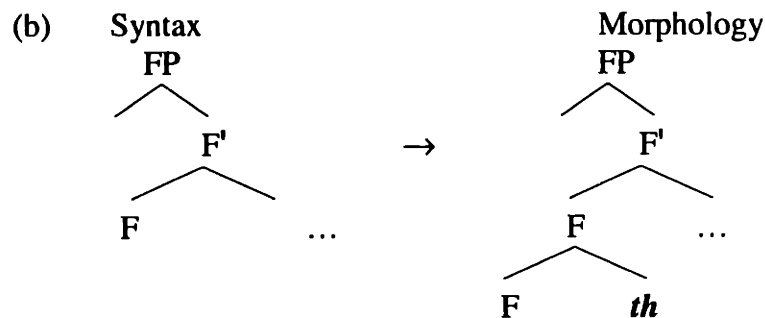
(12) Impoverishment rules (feature deletion)

- (a) [+β] → Ø / ____ [+Past, -Perf, -Subj] (II)
- (b) [+α, +β] → Ø / ____ unmarked context¹⁸ (PI)
- (c) $\begin{bmatrix} [\alpha] \\ \text{u}[\beta] \end{bmatrix} \rightarrow \emptyset / \text{ } ____ [-\text{Past}]$ (PI/PS)

¹⁷ I have ordered the theme features with respect to each conjugation for ease of exposition. Notice however that [-γ], being more specific according to our hierarchy, will be ordered first when competing, i.e. before [+β]. Otherwise, the Vocabulary items organize themselves in the ordering given above.

Second, I propose an analysis of the verbal forms that treats the traditional theme vowel as the realization of a morphological well-formedness requirement on a syntactic functional head v (= 'little v '). Furthermore, to account for the allomorphy of the inflectional affixes shown in Table 2, I extend this requirement to *all* syntactic functional heads, as stated in (13(a)) and implemented in (13(b)).

- (13) (a) Morphological well-formedness condition on F_0 's
Every F_0 requires a theme position



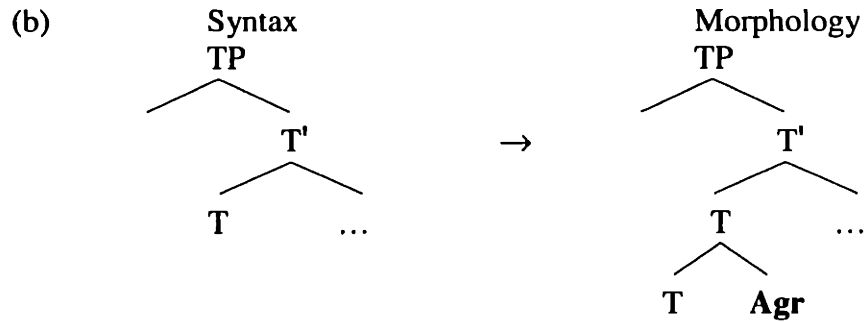
Hence, a given verbal form might have as many theme vowels as there are functional heads in the syntactic structure that are single terminal nodes.¹⁹ I will extensively discuss the nature and function of this new functional-head-related notion of theme vowel in section 3 below.

In addition to the well-formedness condition in (13), in Catalan, all well-formed finite verbs must bear morphological agreement with the subject. This is implemented in the morphology by a further morphological well-formedness requirement, this time on T, as shown in (14).

- (14) (a) Morphological well-formedness condition on finite T
Finite T requires an Agr morpheme.

¹⁸ I will discuss the exact meaning of 'unmarked context' in section 4.3 below.

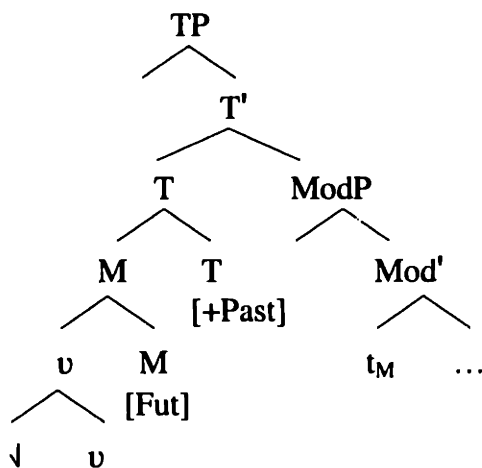
¹⁹ After reading the first draft of this work, Jim Harris pointed out to me that Williams (1981) makes a similar proposal for Latin verbs. There are crucial differences, though. In his analysis, the allomorphy of his 'connective vowels' is explained in terms of a system of diacritic features, i.e. roots and tense 'markers' bear lexical diacritics that determine the class of the following vowel. Notice that this is a stipulation. In my analysis, the existence of multiple theme vowels and their allomorphy follow from a general property of the language system.



In (15), I illustrate the application of these two well-formedness conditions for the derivation of the 2sg conditional form of the verb *aguditzar* 'sharpen'. After the syntactic operations, the structure in (15(b)) enters into the morphology where our well-formedness conditions supply each functional head with a theme position and finite T with an Agr node, as shown in (15(c)). The precise derivation will be discussed in section 3 and extensively illustrated in section 4.

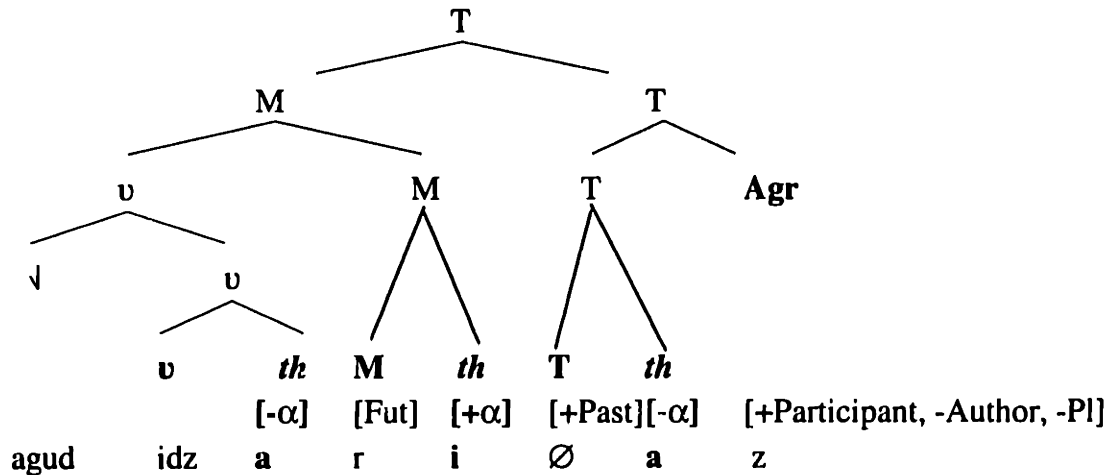
(15) (a) *aguditzar*ies [əgudidzər'ias] 'you would sharpen' (2sg Conditional)

(b) Input to Morphology (after syntactic operations)²⁰



²⁰ Here and throughout I will omit irrelevant structure.

(c) After morphological operations and *Vocabulary Insertion*



Hence, what in Table 2 above was a single conditional morpheme [r'iə] is reanalyzed as four different phonological exponents /r-i-Ø-a/ (before phonological rules apply).

Furthermore, these two well-formedness requirements, the set of Vocabulary items given in (16), and the impoverishment and fusion operations in (17) allow us to explain the allomorphy of the inflectional affixes in Table 2 and to capture the correlations (*total* and *partial syncretism*) illustrated in (5) through (8) above.

(16) Vocabulary items²¹

(a) Inflection

[r] ↔ [+Fut]

[r] ↔ [+Past, +Perf]

[s] ↔ [+Past, +Subj]

[b] ↔ [+Past] / [-α] ____ (=in the context of a default theme)

[ə] ↔ [-Finite] / [+β] ____ (for a particular set of roots)

[r] ↔ [-Finite]

[d] ↔ [+Participle, +Past]

[nt] ↔ [+Participle, -Past]

²¹ Here, Vocabulary items are organized into two blocks, (a) and (b), for inflection and agreement respectively. Notice that [u] is realizing both kinds of features. As will become clear later, other Vocabulary items realizing only agreement features will be able to be inserted in a fused T/Agr node.

- (b) Agreement
- [u] ↔ [-Past, -Subj, +Part, +Auth, -Pl]
- [z] ↔ [+Part, -Auth, -Pl]
- [m] ↔ [+Part, +Auth, +Pl]
- [w] ↔ [+Part, -Auth, +Pl]
- [n] ↔ [+Pl]
- (17) (a) Impoverishment rule
- T → Ø / _____ [+Participant, +Plural]
- |
- [-Past]
- (b) Fusion
- T and Agr fuse in the morphology in unmarked environments.

In addition, the analysis of what constitutes a Catalan verbal form sketched above will allow us to assert that the position of stress for verbs is fully predictable and systematic. Adopting Halle & Idsardi's (1997) framework, I claim that stress need not be present in underlying representations, but rather, stress assignment is the result of the application of a single rule, stated in (18).

- (18) Line 0:
- a. Each vowel (syllable head) projects an abstract mark.
 - b. The T node projects a right boundary to its left (the left of the phonological exponent realizing T(/AGR)).
 - c. The rightmost element of each constituent on line 0 projects an abstract mark onto line 1.

That is, for *all* verbs and for *all* tenses, given our analysis, stress falls on the stress-bearing unit immediately preceding the T node. This constitutes a strong argument in favor of the view that word formation is mediated by the syntax.

This analysis has significant consequences for word formation and stress assignment in non-verbal environments as well. Since I argue against positing underlying stress in the verbal environment, this means that roots have no underlying stress. However, we can form verbs, nouns, etc. out of the same roots. Given the analysis I propose for verbs, we expect that, in non-verbal environments, some functional head projects a boundary on the metrical plane, as T does in the verbal environment. Although

there will be cases in which stress is an idiosyncratic property of a root, i.e. it is 'lexical', I will show that the analysis of stress that I propose for verbal environments can also be extended to non-verbal environments. The extension of the analysis to non-verbal environments has two important consequences. First, it unifies the assignment of stress in Catalan. Second, according to our well-formedness condition on functional heads in (13(a)), a theme position is adjoined to *any* F_0 . Thus, we expect that such a purely morphological position is also non-vacuously adjoined in non-verbal environments to the F_0 that will project a boundary in the metrical plane for stress assignment. The prediction of our analysis is borne out in non-verbal environments by the presence of the so-called *class markers*.²² Hence, it is a consequence of my analysis that verbal theme vowels and non-verbal class markers are unified as being both the result of the application of a well-formedness condition on F_0 's. This might have unexpected consequences for the entire morphophonology of Catalan and of other Romance languages as well.²³

Ultimately, this analysis provides strong evidence for syntactic word formation. Hence, I argue that Distributed Morphology is superior to word-based approaches to inflection in that cyclicity problems are avoided by having the whole structure available for late vocabulary insertion of underspecified Vocabulary items. Moreover, DM provides the appropriate tools and mechanisms to express the generalizations at hand, and to unify a number of *a priori* unrelated issues in a natural way.

The thesis is organized as follows. In section 2, I sketch the basic notions of Distributed Morphology that will be adopted throughout the analysis. In section 3, I discuss the crucial points of my proposal. Section 4 will be devoted to the analysis of the regular verbal forms. In section 5, I propose an analysis of stress that follows naturally from the proposed structures. Furthermore, I contrast this analysis with previous approaches that posit unpredictable underlying stress. In section 6, I discuss the implications of my analysis for the entire morphophonology of Catalan. Finally, section 7 contains the major conclusions that may be drawn from the analysis.

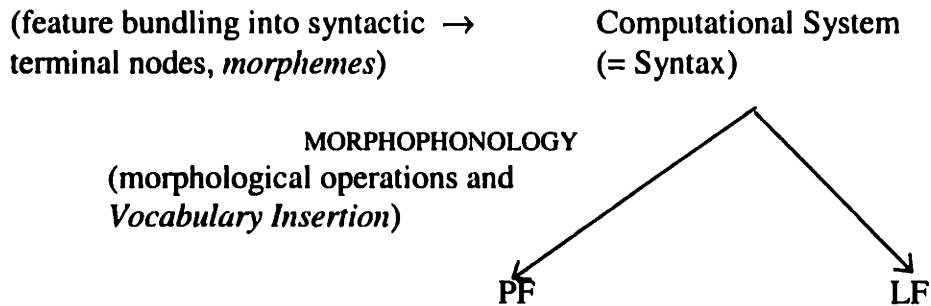
²² See Harris (1991) for the notion of class marker in Spanish.

²³ Indeed, Harris (1999), building on the proposals in previous drafts of this work, provides a new account of Spanish nasal depalatalization that is based on my well-formedness condition on functional heads.

2. Theoretical Background: Distributed Morphology

I will present an analysis within the framework of Distributed Morphology (Halle & Marantz 1993, 1994 and related work). In (19), I give the structure of the grammar that I will assume.

(19) Model of Grammar



In this framework, the syntactic terminal nodes are bundles of syntactic and semantic features, here called *morphemes*, selected by each particular language from a UG alphabet of features and "organized into hierarchical structures determined by the principles and operations of the syntax" (Halle & Marantz (1994:276)). After the operations of the computational system, the structures enter into the morphological component (MS) where morphological processes may further modify them. Crucial in this framework is the fact that morphological operations "are constrained by strict syntactic locality conditions that require that interacting constituents stand in a government relation with respect to each other or be structurally adjacent" (Halle & Marantz (1994:276)). Vocabulary Insertion supplies the terminal nodes, i.e. the *morphemes*, with phonological features. This is a competition-based operation, subject to the *Subset Principle*, as stated in (20) (Halle 1997:428).

- (20) The phonological exponent of a Vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme.

In addition, the operation of Vocabulary Insertion is cyclic, starting from the most deeply embedded morpheme, i.e. the root, and it is contextually sensitive (but primarily local), i.e. the entire syntactic tree structure is available to VI. Furthermore, before VI

there is only "hierarchical nesting of constituents, but no left-to-right order among the morphemes" (Halle & Marantz (1993: 115), so that when VI takes place, a concomitant process of linearization applies supplying adjacency relations (Noyer (1997)).

In (21), I outline other basic notions of this framework that are relevant to our analysis.

(21) (a) The *Vocabulary item* is the basic unit of morphology. It is *underspecified* with respect to the features of the node where it will be inserted. It supplies the terminal nodes with phonological features by Vocabulary Insertion, after all syntactic and morphological operations have taken place (*Late Insertion*).

(b) Semantically vacuous morphemes may be added in the morphology to meet universal or language-specific *well-formedness conditions*. Moreover, "in addition to phonological features, Vocabulary insertion supplies morphological features that signal idiosyncratic properties of specific Vocabulary items" (Halle & Marantz (1993: 136)).

(c) *Fusion* also creates new constituents. It takes two terminal nodes that are sisters under a single category node and fuses them into a single terminal node. Only one Vocabulary item may now be inserted, an item that matches all or a subset of the morphosyntactic features of the fused node.²⁴

²⁴ Recently, Marantz (1999:2) has proposed that the operation of fusion takes place before the syntactic operations, i.e. fusion is reinterpreted as "the combination or bundling of features into morphemes for the computational system," in accordance with the postulates of Chomsky (1998), which means that no similar operation of fusion takes place in the morphology. I will continue to assume that there is an operation of fusion in the morphology. Notice, however, that I have modified the definition of fusion. As stated in Halle & Marantz (1993:116), the item that is inserted in a fused node "must have a subset of the morphosyntactic features of the fused node, including the features from both input terminal nodes." In Catalan, there is only one item that actually includes all (and not a subset of) the features of both input nodes. In all the other cases, the item that is inserted has the features of one of the input terminal nodes. This would support Marantz's (p.c.) claim that there is no real case of morphological fusion. For the analysis developed here, this would imply that Agr is already present in the syntax, and that in the unmarked case it would combine with T prior to the syntactic operations. In marked environments, it would not combine with T and would enter into the morphology as a single terminal node (probably adjoined to T; necessarily, not as a functional node if our analysis is correct), where a Vocabulary item would be inserted. This would have consequences that I am still unaware of, so that I will leave this issue for further research.

(d) *Impoverishment*²⁵ simplifies morphosyntactic representations by deleting features. As a consequence, Vocabulary items specified for those features will not be able to compete for insertion into that node; as a result, less specified items may be inserted.

In addition, I assume Marantz's proposal (1997, 1999a, b) that "the syntactic categories N, V, and A are morphological categories created by the syntax (i.e., post-syntactically realized)" (Marantz (1999b: 1). For our immediate purposes, this means that a root becomes verbal when merged with *v*.

3. The Theme Vowel

The traditional theme vowel is often assumed to be an empty constituent that appears next to a root in order to build a stem or a base to which inflectional affixes can be attached to build a well-formed word. Moreover, it serves to classify the roots to which it attaches into different morphological classes, i.e., conjugations. Although previous approaches have analyzed this theme vowel as either belonging to the root²⁶ or as part of the inflectional ending,²⁷ it seems that in recent approaches, it is generally assumed that it is an independent morpheme.

In this section, I discuss the different elements proposed for the analysis of the verbal forms, which are all related to the role of the theme vowel. First, I discuss the import of the above stated *Markedness Hierarchy (MH)*, as well as our understanding of the notions *marked* and *unmarked environment*. Next, I discuss the two requirements on well-formed Catalan verbs. Finally, an attempt will be made to elucidate the exact nature and function of the new notion of *theme vowel* introduced as a consequence of our proposal.

3.1. Markedness Relations

Of the three Catalan conjugations, only the first conjugation is fully productive. When a new verb is coined, it generally belongs to the first conjugation, as shown in (22(a)-(b)).

²⁵ This operation was first explored and discussed by Bonet (1991).

²⁶ See, for instance Lieber (1982) for Latin, who proposes to list stems with theme vowels and without theme vowels in the lexicon as being different allomorphs.

²⁷ This is what we generally find in Catalan grammars.

- (22) (a) esnifar 'snort' driblar 'dribble'
 (b) pirar 'leave' (slang) clapar 'sleep' (slang)

The third conjugation (*unir*-type verbs) is only partially productive. Some verbs formed 'from adjectives' belong to this class. However, this choice of theme is not arbitrary, since only a particular, semantically related group of adjectives seem to take theme III, as shown in (23(b)). Such 'deadjectival verbs' typically have a causative meaning, something like 'cause to become X', where X is some quality. This similarity of meaning suggests that the selection of the particular theme vowel is a lexical property of the causative morpheme, and not a property of the root itself. This is further illustrated by contrasting these 'causative' verbs with other 'deadjectival verbs' that do not have such a causative meaning, as the ones in (23(a)).

- (23) (a) buit / buidar ple/emplenar
 empty / to empty full / to fill
- (b) negre / ennegrir dolç / endolcir covard / acovardir
 black / blacken sweet / sweeten coward / to daunt

On this basis, I propose that first conjugation verbs (i.e. roots in our analysis) are the default class, i.e. they will have no information about the conjugation class they belong to. The traditional second and third conjugation verbs will include some conjugational information in their lexical entries, i.e. in the root morphemes. Hence, we will find the following contrast among roots. (See the discussion below for the conjugational information of the roots in (24(b)).)

- (24) (a) Roots with no specification for conjugation:
 √kant √plen √buid
- (b) Roots with specification for conjugation:
 √tem_{+β} √un_{+α} √surt_{+γ}

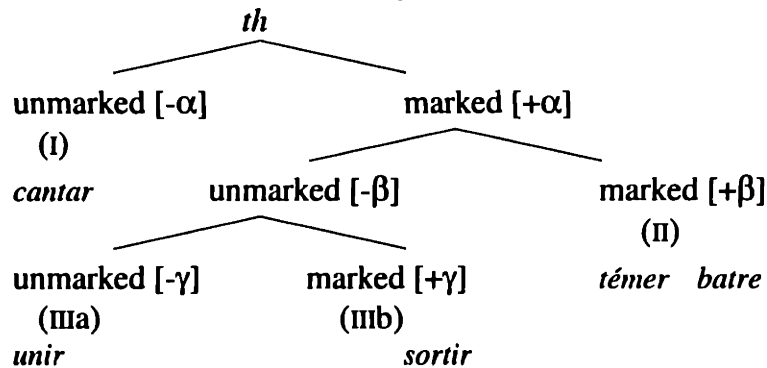
Accordingly, a root lacking itself conjugational information will belong to the first conjugation, *unless the context determines otherwise*. Consider the pair negre/ennegrir 'black, blacken'. The root √negr 'black' itself does not have any conjugational information.

However, it merges with a morpheme that provides such information, and therefore, the default theme vowel is not inserted. We will see that this is achieved by respecting strict locality conditions.

The second conjugation is not productive at all, and it includes the majority of irregular verbs. I take it to be the most marked one, together with the *sortir*-type verbs, which is also a closed class of verbs.

Based on the productivity of the conjugations, we can establish the *Markedness Hierarchy (MH)* given in (25) below, where the traditional first conjugation is the least marked, hence the default one.

(25) Theme Vowel Markedness Hierarchy



Given this hierarchy, I propose that conjugational classes have to be understood as complexes of binary features. That is, conjugations must be understood as being built out of the primitive features $[\pm\alpha]$, $[\pm\beta]$, and $[\pm\gamma]$. This will be consistent with the fact that any morphosyntactic category is expressed in terms of binary features, e.g. tense, aspect, person and number agreement, etc. Crucially, this will allow us to express the interrelations among the different conjugations in a natural way. Thus, as a result of our hierarchy, the verbal conjugations are reanalyzed as in (26).

- | | | | |
|------|-----|------------------------------------|------------------------------|
| (26) | (a) | Conjugation I | $[-\alpha]$ |
| | (b) | Conjugation II | $[+\alpha, +\beta]$ |
| | (c) | Conjugation IIIa (<i>unir</i>) | $[+\alpha, -\beta, -\gamma]$ |
| | (d) | Conjugation IIIb (<i>sortir</i>) | $[+\alpha, -\beta, +\gamma]$ |

Roots will be minimally specified for these features, as shown in (27). Redundancy rules that result from the *Markedness Hierarchy* will automatically provide a full specification of the morphemes, i.e. the terminal nodes. This is shown in (28).

(27) (a) Roots with no specification for conjugation:

√kant

(b) Roots with specification for conjugation:

√tern_[+β]

√un_[+α]

√surt_[+γ]

(28) Redundancy rules

(a) [] → [-α]

(b) [+β] → [+α]

(c) [+α] → [-β, -γ]

(d) [+γ] → [+α, -β]

The most important consequence of this *Markedness Hierarchy* is that it establishes some non-trivial markedness relations among the different conjugations. The default class, [-α], is unmarked with respect to the other two main classes, which are [+α]. However, there is in fact a three way distinction, namely unmarked, marked and what we could call 'specially' or 'doubly' marked. More concretely, the second conjugation, which is [+α, +β], is marked with respect to the third class, [+α, -β] (the *unir*-type), but at the same time, it is 'doubly marked' with respect to the default class, [-α]. Thus, markedness is defined in terms of number of positive feature values, i.e. marked values. This is illustrated in (29).

(29) (a) Second conjugation: [+α, +β] 'doubly marked'

(b) Third conjugation: [+α, -β, -γ] 'marked'²⁸

(c) First conjugation: [-α] 'unmarked'

The claim is that this contrast interacts with the markedness of the environment, concretely, with the degree of markedness determined by the tense morpheme. Thus, a

tense morpheme can be unmarked, marked or 'doubly marked' in the same way as the theme vowels, depending on the value of its features, as exemplified in (30).

- (30) (a) [-Past] 'unmarked T'
 (b) [+Past, -Subj] 'marked T'
 (c) [+Past, +Subj] 'doubly marked T'

Let us see how this proposal accounts for the allomorphy of the theme vowel that we saw in Table 1 above. First, recall the Vocabulary items that realize the theme features proposed in (10), repeated in (31).

- (31) (a) /u/ ↔ [+β] / __ [+Participle, +Past]
 /Ø/ ↔ [+β] / __ [+Future]
 /e/ ↔ [+β] / <elsewhere>
 (b) /ɛʃ/ ↔ [-γ] / __ [-Past]
 /i/ ↔ [+α] / <elsewhere>
 (c) /ɛ/ ↔ [-α] / __ [+Part, +Plural]
 /a/ ↔ [-α] / <elsewhere>

Consider next the examples in (32)-(33). In (32), the first conjugation verb *cantar* 'sing' takes the theme vowel /e/ in the imperfect subjunctive. Notice that this Vocabulary item is the elsewhere phonological exponent of the second conjugation. Similarly, in (33), the second conjugation verb *témer* 'fear' takes the theme vowel /i/, which is the elsewhere phonological exponent of the third conjugation.

- (32) (a) [kənt'esis] 2sg Imperfect Subjunctive
 (b) [] → [+α, +β] / ____ [+Past, +Subj]
 (33) (a) [təm'iəs] 2sg Imperfect Indicative
 (b) [+β] → Ø / ____ [+Past, -Perf, -Subj]

²⁸ The *sortir*-type verbs, being [+α, -β, +γ], are 'doubly marked' as are the second conjugation verbs.

(c) $[-\beta] \rightarrow [+ \alpha, -\gamma]$

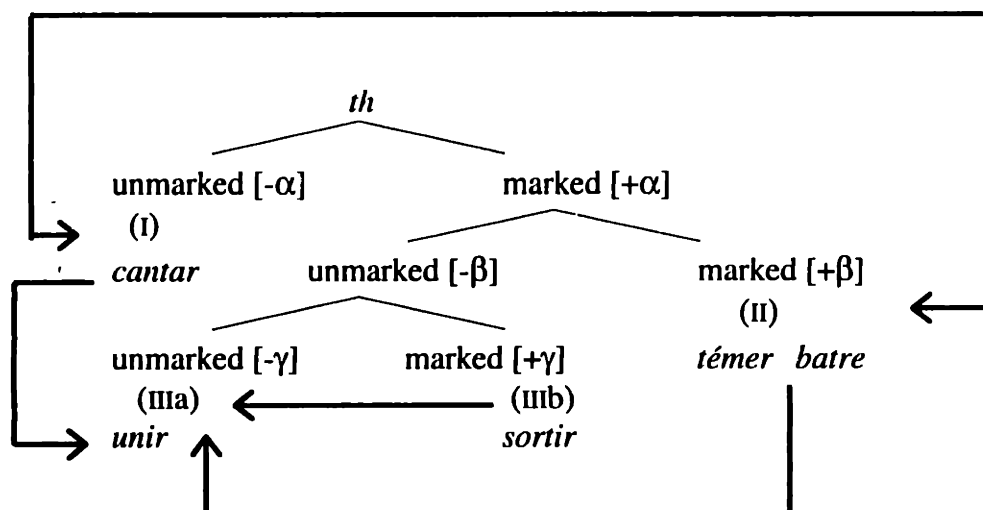
The claim is that since these two Vocabulary items, /e/ and /i/, are already listed, we do not need to list them again as specific phonological exponents of the first and second conjugations respectively. Instead we have the specific Redundancy rule given in (32(b)) and a Readjustment rule given in (33(b)).²⁹ It is crucial to note that these rules result from the interaction of the *Markedness Hierarchy* and the degree of markedness of the tense morpheme. Thus, informally, the rule in (32(b)) means that an unmarked theme becomes specially marked in a specially marked context; the Impoverishment rule in (33(b)) turns a specially marked theme vowel into a marked one in a marked environment. In the latter case, I assume that when the positive value of a feature is deleted, the negative value for that feature is automatically supplied (see Noyer (1997)). The Redundancy rule given in (33(c)) will supply the terminal node with full specification, i.e. $[-\beta]$ is necessarily $[+ \alpha]$ and, by default, $[-\gamma]$.

Thus, in this way we do not need to multiply the number of Vocabulary items. Instead, we capture the fact that the selected allomorph is the elsewhere phonological exponent of another Vocabulary item that is already listed. As Halle (1997: 445) points out, this argument implies that "language acquisition in humans is constrained so as to force the learner to utilize maximally already existing Vocabulary items."

As will be shown in section 4, there are other relations among the conjugations that will be accounted for in terms of markedness. These are as depicted in (34) by the different arrows.

²⁹ Following a suggestion from Marantz (p.c.), I assume that feature-filling rules are specific Redundancy rules. Feature-deletion rules are Impoverishment rules, which are considered Readjustment rules.

(34) Theme Suffix Interrelations



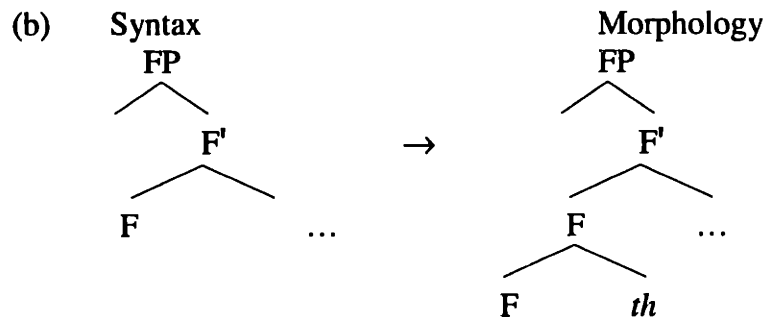
At this point, the reader may be curious as to why only the default class and the most marked classes are sensitive to the markedness of the context, i.e. why *unir*-type verbs are never affected by the context. Notice that, as depicted in (34), it seems as if the *unir*-type conjugation is the default one, since it is itself never modified, and almost all changes turn a theme vowel into a $[+\alpha, -\beta, -\gamma]$ theme. Moreover, as far as I can tell, this third conjugation is completely regular, while the first and the second show different degrees of irregularity. Based on these facts, we can consider the first conjugation as the default one in terms of productivity, while this third conjugation, i.e. *unir*-type verbs, is the default one in terms of morphological regularity.

3.2. Multiple Theme Vowels

Morphology must derive well-formed morphological words in any particular language. In Catalan, as in many other languages, stems are formed by the addition of a morpheme, the theme vowel, which itself makes no semantic or syntactic contribution. I depart from this traditional view in two ways. First, I claim that stems have no theoretical status in the present analysis. In this view of morphology, there exist only *functional* and *root morphemes* on the one hand, and *Vocabulary items* on the other. Moreover, to refer to stems in this framework would mean that there is some intermediate step in word formation to which we may or must refer, which is not the case. Second, and more important, I propose that the addition of a theme vowel must be understood as a

morphological requirement on syntactic functional heads, as stated in (35(a)), and implemented in (35(b)), where FP stands for any functional phrase.³⁰

(35) (a) Every F_0 requires a theme position



We have just proposed that the theme vowel is a requirement on functional heads. Now, recall what we said at the beginning of the introduction: a verb is idiosyncratically classified into a conjugational class by virtue of the theme vowel it selects. In other words, the fact that the root /kant-/ takes /a/ but the root /surt-/ takes /i/ must be learned by the child, i.e. it is a 'lexical' fact that cannot be predicted. As we saw in the previous subsection, this means that these roots have a theme feature in their entry that tells us which pattern they follow. An immediate question arises, namely how this fact can be compatible with our well-formedness condition on functional heads.

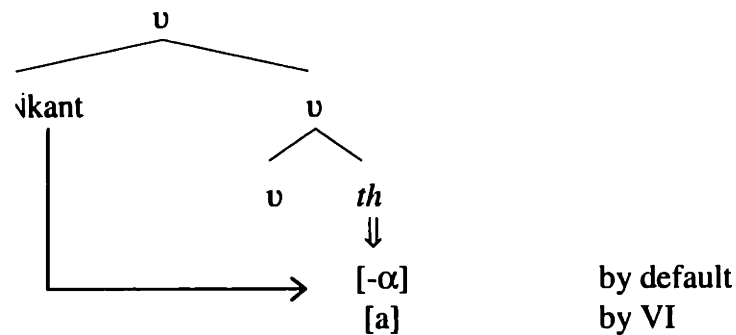
The label *th* in (35(b)) above stands for the position *theme*, i.e. it does not refer to any particular theme class. In the absence of any other information, a default theme will be inserted. It is important to understand that *th* is neither \emptyset nor the default theme, but a morphological theme node or theme position.

A question is raised as to how the theme feature of the root happens to be realized as a morphological requirement on *v*. We will see that the other functional projections will take a default theme vowel in the unmarked case. Thus, apparently, *v* behaves differently. But, indeed, this is only apparently so. The choice of the theme vowel always depends on the *availability of contextual information*. When a root morpheme is inserted, it may or may not have a theme feature, as we saw in (27) above. While class II and III

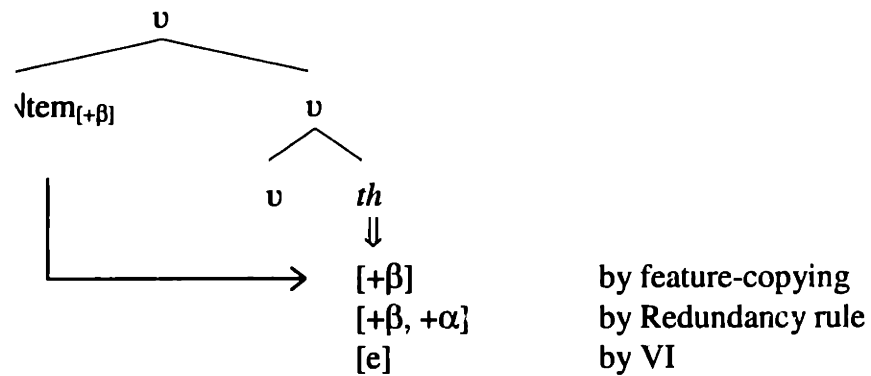
³⁰ This condition will apply only to 'non-defective' functional heads. Concretely, non-finite T, being defective, will not require a theme suffix. This will explain the non-finite verbal forms infinitive, gerund and participle, where no theme vowel follows the tense/aspect morpheme.

roots incorporate this information into the structure, any other root lacks such information. This is illustrated in (36) for *cantar*, *témer* and *unir*, with partial derivations in the elsewhere case. In (36(a)), a root that bears no morphological information is inserted. When the theme position has to be filled in, it 'scans for' local contextual information. In the absence of any information, a default theme feature $[-\alpha]$ is inserted. In (36(b)-(c)) however, the insertion of the root provides the structure with such information, so that the morphological feature of the root is copied onto the theme position, where further Redundancy rules will provide the position with a full specification.

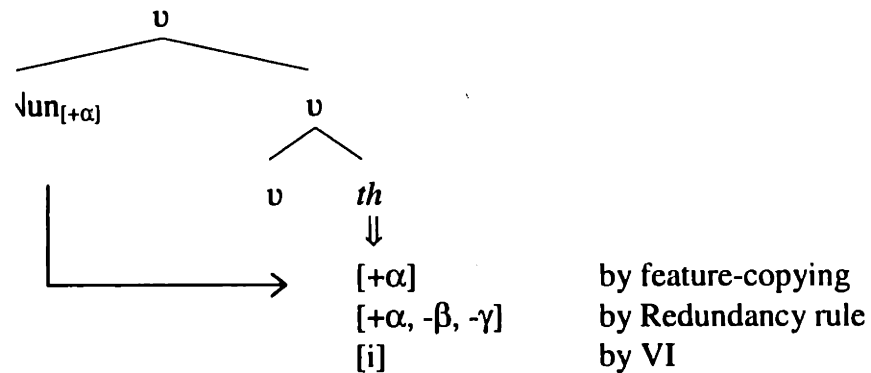
(36) (a)



(b)



(c)



Exactly the same behavior is found for the other functional heads, where the choice of the theme is also context-sensitive.

In addition, notice that by the insertion of the root, a new morphological feature which was not available before VI is introduced in some cases, as for the verbs *témer* or *unir* above, but not for *cantar*. This implies that if there are rules that refer to this new morphological information, they will necessarily have to apply after the insertion of the root. That is, morphological rules must be allowed to apply in a cyclic fashion, too. Thus, I argue that we must distinguish between morphological rules whose context is provided by the syntax and morphological rules whose context is provided by Vocabulary Insertion, e.g. the morphological feature inserted in the structure by the insertion of a second or third conjugation root. If we assume that morphological rules apply as soon as their context is met, we will have an intrinsic ordering of rules; as a result, there is no need to stipulate an extrinsic ordering.

At this point, another question arises: why is the theme vowel not realized in *v* itself? Do we really need a well-formedness requirement on F_0 's as stated above? Or is it a mere device? These are the questions that I will attempt to answer in the next subsection.

3.3. Nature and Function of the Theme Vowel

In the previous subsection we asked whether the realization of the theme vowel determined by the root in an adjoined morphological node was a mere device. Up to this point, in all the examples we have used, the functional head *v* has been realized by a zero-morpheme. The question that arises is whether *v* is always phonologically null, in which case our well-formedness requirement would seem rather *ad hoc*. Consider the examples in (37)-(38). I use the conditional tense, which involves more functional heads with their corresponding theme positions, for purposes of illustration.

- (37) (a) agud idz a r i Ø a z 'sharpen'
- ↓ v [-α] M [+α] T [-α]
- (b) teor idz a r i Ø a z 'theorize'

- (38) (a) a prufund i r i Ø a z 'deepen'
 $v_{[+\alpha]}$ ³¹ ↓ [+α] M [+α] T [-α]
 (b) en rik i r i Ø a z 'enrich'

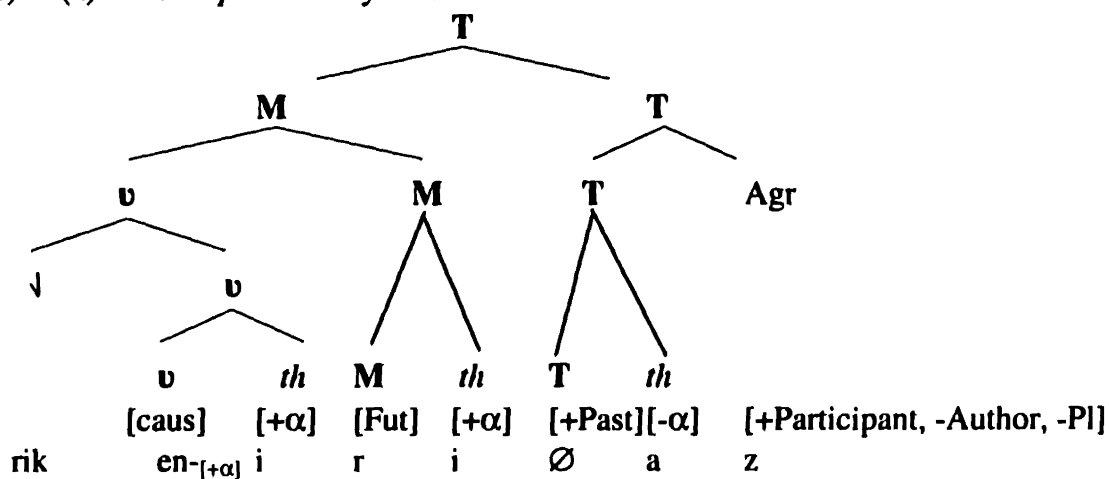
In all these cases, the functional head *v* is thus phonologically realized by a causativizer morpheme. Consider the English counterparts of these causative verbs for a moment. The English verbs 'sharpen,' 'theorize,' 'deepen,' and 'enrich' show special causative morphology as well. This causative morpheme is what verbalizes the root and is therefore realized in *v*. In Catalan, however, there is an additional morpheme, the theme vowel. Where is it realized? This leads us to consider the nature and function of the theme vowel.

According to Aronoff (1994:46), the theme vowel is an empty morph that serves "to determine the conjugation of the verb stem, or which inflectional affixes will realize the various morphosyntactic properties that the verb bears in a particular instance." In other words, "the function of the theme vowel is to select the verb ending" (Aronoff (1994:52)). We have shown in Table 2 above that this is not entirely true for Catalan. Although we may say that the theme determines the inflectional suffix in (39), exactly the opposite happens in (3) above, repeated in (40) below.

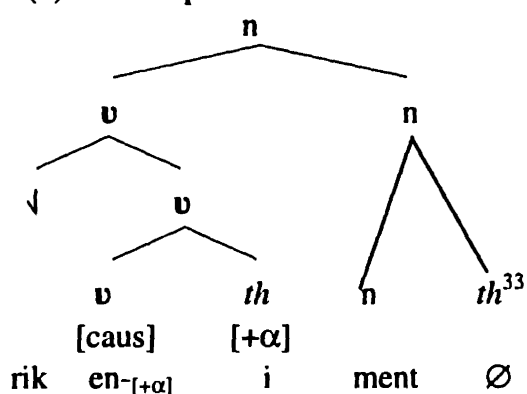
- (39) [kənt- 'a- b-ə- s]
 sing th II 2sg
- (40) (a) [təm- 'e- Ø- m]
 fear th PI/PS 1pl
- (b) [kənt- 'e- s- Ø]
 sing th IS 3sg

As for the nature of the theme vowel, according to Aronoff (1994:46), "the theme vowel is thus a marker of the category verb," and "it appears after the morph that carries the category verb, regardless of whether that morph is a root or an affix." If we take these statements seriously, we can provide a better understanding about the true nature of the theme vowel. As I understand it, what determines the 'category verb' in our approach is not the functional head *v* alone. A verb is a root whose nearest c-commanding functional morphemes are *v*, Tense, Aspect and Mood.³² Thus, a root becomes *verbal* when it merges with the verbalizing head *v*, but it does not become a verb unless it is c-commanded by the functional head(s) T/A/M. This contrast is shown in (41).

(41) (a) *enquiries* 'you would enrich'



(b) *enrichment* 'enrichment'



³¹ Notice that it is irrelevant for our purposes here whether the Vocabulary item is realized as a prefix or as a suffix. This is just a property of the Vocabulary item itself.

³² The definition is adapted from the DM web-page (URL listed under Noyer in the references)

³³ I will discuss this *th* position in section 6 below.

Under this view, and adapting Aronoff's insights, we can understand the nature of the theme vowel to be a morphological requirement on functional morphemes in the verbal environment, i.e. *v* and *T/A/M*, as we have proposed. That is, since theme vowels are category markers or classifiers, this analysis provides a strong argument for a syntactic approach to word formation in which morphological categories are determined by the syntactic configuration.

To summarize, in this section I have discussed and settled the main points of my proposal. I have reanalyzed the notion of theme vowel in terms of abstract binary features that result from a Markedness Hierarchy. I have further proposed that this new theme vowel is inserted in the morphology as a result of a well-formedness condition on syntactic functional heads. I have argued that the theme vowel serves to signal, in the morphology, the category 'verb' created in the syntax, thus providing empirical support to Marantz's (1997, 199a, b) proposal.

The next section is devoted to the implementation of these proposals for the analysis of the regular verbal forms in Catalan.

4. Regular Verbs: A New Approach

For the analysis, I assume standard Tense/Mood/Aspect features for the different verbal forms, as depicted in (42). This classification is based on syntactic considerations.

(42)	Infinitive	[-Finite, -Participle]
	Gerund	[-Finite, +Participle, -Past]
	Participle	[-Finite, +Participle, +Past]
	Present Ind.	[+Finite, -Past, -Subjunctive]
	Present Subj.	[+Finite, -Past, +Subjunctive]
	Imperfect Ind.	[+Finite, +Past, -Subjunctive, -Perfect] ³⁴
	Imperfect Subj.	[+Finite, +Past, +Subjunctive] ³⁵
	Simple Past	[+Finite, +Past, +Perfect]
	Future	[+Finite, -Past, +Future]
	Conditional	[+Finite, +Past, +Future]

³⁴ I assume that the imperfect indicative is [+Past, -Perf, -Subj], although it is a matter of debate whether these features are the right ones for semantic interpretation.

³⁵ As for the imperfect subjunctive, despite its name, it is unclear whether it should have the feature [-Perf]. Wheeler (1979) for instance assumes that it is morphologically [+Perf]. For the moment, I assume that the imperfect subjunctive is not specified for this feature, although we will see that first and third person singular of the imperfect subjunctive seem to pattern with the same forms of the simple past, and not with the imperfect indicative (see the discussion below).

I will start the analysis with the least problematic forms (future, conditional and past tense) and move on to consider the less transparent cases (present tense). I will further show how minor adjustments to the analysis permit us to account for several idiosyncrasies of Catalan verbal morphology in a principled way.

I will exemplify each tense with the following roots.

- (43) (a) \downarrow kant 'sing'
- (b) \downarrow tem_[+β] 'fear' \downarrow bat_[+β] 'beat'³⁶
- (c) \downarrow un_[+α] 'join' \downarrow surt_[+γ] 'go out'

4.1. Future and Conditional

I show in (44) the future and the conditional forms for the different conjugations.³⁷

(44) Future and Conditional forms

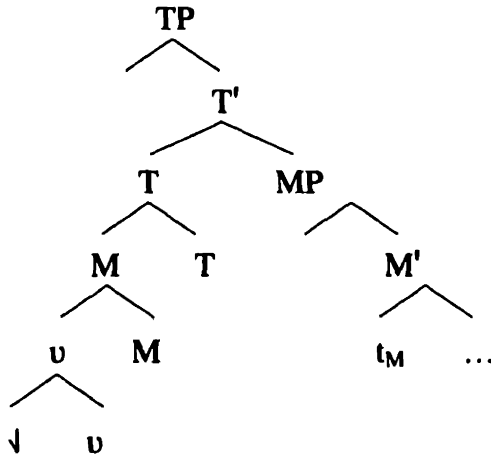
	I Conjugation	II Conjugation		III Conjugation	
	'cantar'	'témer'	'batre'	'sortir'	'unir'
Future [Fut] [-Past]	kənt-ə-'r-e	təm-Ø-'r-e	bət-Ø-'r-e	surt-i-'r-e	un-i-'r-e
	kənt-ə-'r-a-z	təm-Ø-'r-a-z	bət-Ø-'r-a-z	surt-i-'r-a-z	un-i-'r-a-z
	kənt-ə-'r-a-Ø	təm-Ø-'r-a-Ø	bət-Ø-'r-a-Ø	surt-i-'r-a-Ø	un-i-'r-a-Ø
	kənt-ə-'r-ε-m	təm-Ø-'r-ε-m	bət-Ø-'r-ε-m	surt-i-'r-ε-m	un-i-'r-ε-m
	kənt-ə-'r-ε-w	təm-Ø-'r-ε-w	bət-Ø-'r-ε-w	surt-i-'r-ε-w	un-i-'r-ε-w
	kənt-ə-'r-a-n	təm-Ø-'r-a-n	bət-Ø-'r-a-n	surt-i-'r-a-n	un-i-'r-a-n
Cond. [Fut] [+Past]	kənt-ə-'r-i-Ø-ə-Ø	təm-Ø-'r-i-Ø-ə-Ø	bət-Ø-'r-i-Ø-ə-Ø	surt-i-'r-i-Ø-ə-Ø	un-i-'r-i-Ø-ə-Ø
	kənt-ə-'r-i-Ø-ə-z	təm-Ø-'r-i-Ø-ə-z	bət-Ø-'r-i-Ø-ə-z	surt-i-'r-i-Ø-ə-z	un-i-'r-i-Ø-ə-z
	kənt-ə-'r-i-Ø-ə-Ø	təm-Ø-'r-i-Ø-ə-Ø	bət-Ø-'r-i-Ø-ə-Ø	surt-i-'r-i-Ø-ə-Ø	un-i-'r-i-Ø-ə-Ø
	kənt-ə-'r-i-Ø-ə-m	təm-Ø-'r-i-Ø-ə-m	bət-Ø-'r-i-Ø-ə-m	surt-i-'r-i-Ø-ə-m	un-i-'r-i-Ø-ə-m
	kənt-ə-'r-i-Ø-ə-w	təm-Ø-'r-i-Ø-ə-w	bət-Ø-'r-i-Ø-ə-w	surt-i-'r-i-Ø-ə-w	un-i-'r-i-Ø-ə-w
	kənt-ə-'r-i-Ø-ə-n	təm-Ø-'r-i-Ø-ə-n	bət-Ø-'r-i-Ø-ə-n	surt-i-'r-i-Ø-ə-n	un-i-'r-i-Ø-ə-n

³⁶ I will provide the verbal forms of the verb *batre* only in the discussion of the future, the conditional and the non-finite forms. This is the only place where *témer* and *batre* differ. In the future and in the conditional this difference is actually superficial: for *témer*, in the phonology, an epenthetic [ə] will be inserted giving [təməré]. No epenthesis takes place in [bətré], as the string [tr] is licit in Catalan. In the infinitive, however, we will see that the difference is in the choice of the Vocabulary item realizing the [-Finite] feature.

³⁷ Here and throughout, the forms must be understood as the surface forms after some phonological rules have applied, specifically, after stress assignment and vowel reduction, but before final devoicing, cluster simplification and epenthesis. Giving the forms after epenthesis could lead to misinterpretations (confusing an epenthetic schwa with a theme).

Future and conditional both have the same syntactic structure as input to the morphology, the one shown in (45). In the syntax, a root placeholder merges with *u* and further undergoes cyclic head-to-head movement all the way up to Tense.³⁸

(45) Input to Morphology (Future & Conditional)



In the unmarked case, Tense (T), Mood (M) and Aspect (A) will combine for the computational system, i.e. prior to the operations of the syntax. Crucially, in the future and the conditional, the computational system cannot bundle the Tense/Mood/Aspect features into a single terminal node. Neither may they fuse in the morphology, since for Catalan, I claim that only T and Agr may fuse in the morphology in the unmarked environment. This means that for these forms we are left with two different nodes,³⁹ Tense and Mood, which will be realized by two different phonological pieces. Moreover, being two different syntactic heads in the morphological component also means that each will take a theme vowel.

Now, the question is why Tense and Mood are not bundled into a single node prior to the syntactic operations in the future and the conditional. As Halle & Marantz (1993:121) point out, "feature complexes [] must satisfy all universal and language-specific constraints on combining such features." Therefore, I propose that in the case at

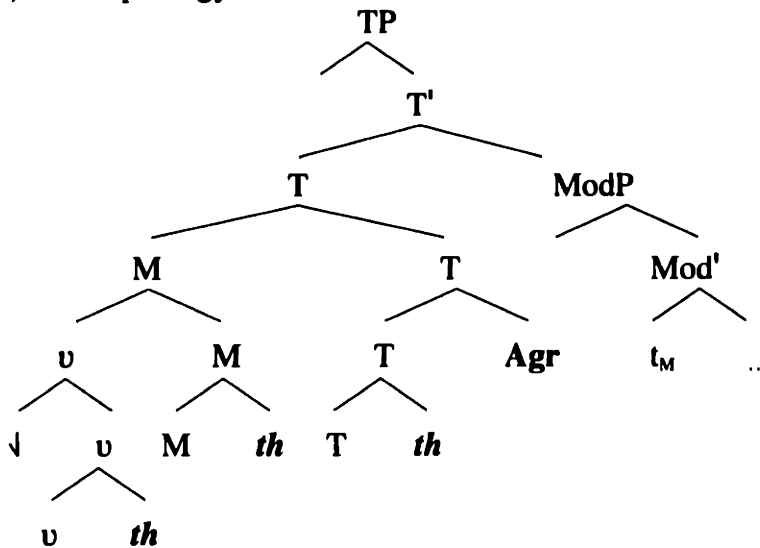
³⁸ I am assuming that Baker's (1985) *Mirror Principle* is correct, so that superficially more deeply embedded morphemes are lower in the syntactic structure, i.e. in the case at hand, Mood is below Tense.

³⁹ I assume that Aspect never projects its own functional projection in Catalan, since there is no specific Vocabulary item that realizes Aspect features independently. Therefore, from now on I will omit it from the structure with the understanding that it is present but combined with some other functional head. It remains to be decided how this approach to Aspect fits in with standard assumptions about the relative ordering of T/M/A in the syntax.

hand, the modal feature [+Future] cannot combine with the tense features, perhaps for semantic reasons, thus accounting for the fact that this feature bundling is blocked.

Once the structure in (45) enters into the morphology, it must immediately meet any well-formedness condition imposed by the grammar of the language (and perhaps also any universal constraint on well-formedness).⁴⁰ I have proposed that Catalan has two such requirements, one on agreement for finite forms, and one on syntactic functional heads. These requirements are met by the addition of the relevant nodes, as depicted in (46). Thus, in (46), all functional heads that are terminal nodes are modified in the morphology by the addition of a theme position *th*. The terminal node T is further modified by the addition of an Agr node, into which the φ -features of a c-commanding DP will be copied.

(46) Morphology: After well-formedness condition



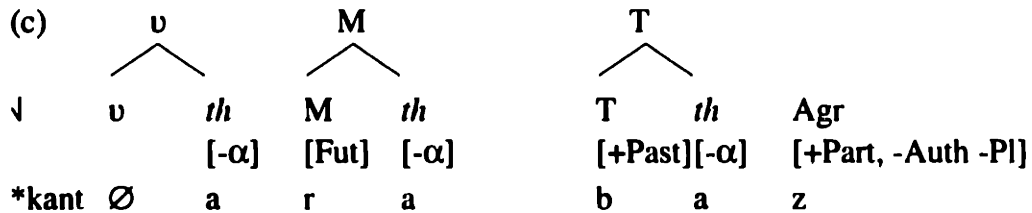
Let us first consider the conditional forms. As we said in section 2, when VI takes place, a concomitant process of linearization applies supplying adjacency relations. For instance, given the above structure, we obtain the form given in (47(c)) for the second singular conditional form of the verb *cantar*, [kəntəríəs], after VI and before the application of phonological rules (stress assignment, final devoicing and vowel reduction). That is, given the above structure, in the absence of any contextual

⁴⁰ I depart here from Noyer (1997) who assumes that well-formedness conditions are met in what he calls a 'second phase' in the morphological component, after all processes of fusion, impoverishment, etc have taken place.

information the theme positions are realized by the feature $[-\alpha]$, i.e. by the default theme vowel, as a result of the application of the Redundancy rule given in (47(b)). Recall that this rule need not be stipulated, it simply follows from our *Markedness Hierarchy*.

(47) (a) [kəntər'ias] 2sg C

(b) [] $\rightarrow [-\alpha]$



However, this is not the expected result. The predicted form is different from the actual Catalan. The theme vowel taken by the Mood node is the default one. Given our vocabulary entries, the Vocabulary item /b/ is inserted in a $[+Past]$ Tense node, in the context of the default theme. Thus, in order to prevent this result, I suggest the specific Redundancy rule in (48(a)). This rule states that the default theme vowel of the Mood node becomes marked in the context of $[+Past]$. In other words, given our *Markedness Hierarchy*, the unmarked theme becomes marked in a marked context. Also, our *MH* further provides the terminal node with full specification in the form of the Redundancy rule shown in (48(b)).

(48) (a) Redundancy rule
[] $\rightarrow [+ \alpha] / [Fut] \text{ ______ } [+Past]$

(b) Redundancy rule
 $[+ \alpha] \rightarrow [-\beta, -\gamma]$

As a result, when Vocabulary Insertion takes place, the elsewhere phonological exponent /i/ is inserted, because it matches a subset of the features of the terminal node, namely $[+ \alpha]$. Consequently, the Vocabulary item /b/ can no longer be inserted. No other past morpheme can be inserted either. I assume that UG provides the node with a zero phonological marker.

(49) [kəntər'ias]

[N	u	th	M	th	T	th	Agr]
		[-α]	[Fut]	[+α]	[+Past][-α]	[+Part, -Auth -Pl]	
kant	Ø	a	r	i	Ø	a	z

The same correct results are obtained with all the other forms for all conjugations. However, the issue of 'zero phonological marker' deserves some attention. Recall that there is no specific agreement morpheme for first and third person singular, or for [-Past] or default [+Past], etc. I did not posit a default morpheme of the form shown in (50) either, i.e. a zero morpheme that would compete for insertion in any node.

(50) /Ø/ ↔

I take the radical view, following a suggestion from Marantz (p.c.), that a phonological zero-morph is inserted in a given node at no cost. This was previously suggested in Halle & Marantz (1993:134), where they state that "[i]t may be that Universal Grammar provides a zero spell-out as the default phonological realization of a morpheme in the unmarked case. This possibility in no way undermines the existence of zero morphemes." As for the existence of (blocking) zero-morphemes in Catalan, consider the conditional forms of the second conjugation verbs *témer* and *batre*, repeated in (51). In those cases, the existence of a more specific phonological exponent of [+β], /Ø/, blocks insertion of the second conjugation default theme /e/.⁴¹

(51) təm-Ø-r-'e, təm-Ø-r-'a-z, təm-Ø-r-'a, təm-Ø-'r-ε-m təm-Ø-'r-ε-w təm-Ø-r-'a-n
bət-Ø-r-'e, bət-Ø-r-'a-z, bət-Ø-r-'a, bət-Ø-'r-ε-m, bət-Ø-'r-ε-w, bət-Ø-r-'a-n

We can now turn to the future forms. Here again, given the structure in (46), we cannot obtain the right results, as shown in (52) for the second singular future form of the verb *cantar*.

⁴¹ Notice that we could posit an Impoverishment rule deleting the theme features in this context. Nonetheless, such a rule would be specific to this conjugation in this particular context. Therefore, I will continue to assume the existence of a zero-morpheme that realizes the feature [+β].

- (52) [kəntər'as] 2sg F
- | | | | | | | | |
|-------|---|------|-------|------|---------|------|---------------------|
| [↓ | u | th | M | th | T | th | Agr] |
| | | [-α] | [Fut] | [-α] | [-Past] | [-α] | [+Part, -Auth, -Pl] |
| *kant | Ø | a | r | a | Ø | a | z |

To account for these facts, I propose that Tense fuses in the morphology with the Agr node in the unmarked environment, i.e. in this case [-Past]. This will give us the right result, as shown in (54) below.

- (53) Fusion
T and Agr fuse in the morphology in the unmarked environment.

- (54) [kəntər'as]
- | | | | | | |
|------|---|------|-------|------|----------------------------|
| [↓ | u | th | M | th | T/Agr] |
| | | [-α] | [Fut] | [-α] | [-Past, +Part, -Auth, -Pl] |
| kant | Ø | a | r | a | z |

There is a problem, however. Given our definition of fusion above in (21(c)), this looks like an illegitimate operation. Recall that before this morphological operation, the Tense node has the structure illustrated in (55).

- (55)
- ```

 T
 / \
 T Agr
 / \
 T th

```

At this point, the terminal nodes T and Agr are not properly structurally adjacent, since there is an intervening theme vowel. To assume that they fuse before the theme vowel requirement is met would lead to two other problems. Specifically, we would have to assume that different well-formedness conditions are met at different points in the derivation, i.e. first the well-formedness condition on agreement, then the morphological operation of fusion, and finally the well-formedness condition on theme vowels. Furthermore, we would have to stipulate that a syntactic functional head is prevented from taking a theme vowel when fused with a non-syntactic functional head (or, in other words, is not required to meet the well-formedness condition), since this would not necessarily follow from the well-formedness requirement. Now, notice that at this point,

the morphological theme position has no features, it is empty until the cyclic operation of Vocabulary Insertion takes place. A possible solution to this problem could then be that there is no feature that can block the fusion operation. Hence, I will assume that T and Agr may fuse in this configuration in the unmarked environment, resulting in a single node T/Agr into which a single morpheme will be inserted.

There is still another issue, namely, the theme vowel of the functional head Mood. Our vocabulary entries, repeated in (56), will provide us with the correct results for all forms, except for the first singular, which surfaces with an [e] as in [kəntər'e].

- (56) /ɛ/ ↔ [-α] / \_\_\_\_ [+Part, +Plural]  
 /a/ ↔ [-α] / <elsewhere>

We will see that the form of first person singular verbs is often idiosyncratic. For the future inflectional morphology, any solution will have to be stipulative. For the moment, I propose the very specific rule given in (57(a)). Notice that in this case, this rule does not follow from any of our assumptions about the Catalan verbal system. It is simply an idiosyncratic rule that must be stated to account for this particular fact. The Redundancy rule in (57(b)) will provide the theme morpheme with full specification.

- (57) (a) [ ] → [+β] / \_\_\_\_ [-Past, +Part, +Auth, -Pl]  
 (b) [+β] → [+α]

#### 4.2. Past Tense

I will be concerned here with the three synthetic past verbal forms in Catalan.<sup>42</sup> As shown in (58), Catalan distinguishes between imperfect and perfect simple past, and between subjunctive and non-subjunctive past.

<sup>42</sup> There is an analytic past form, illustrated in (i), that is generally used instead of the Simple Past form and is the same for all verbs. I will leave the analysis of these forms for further research.

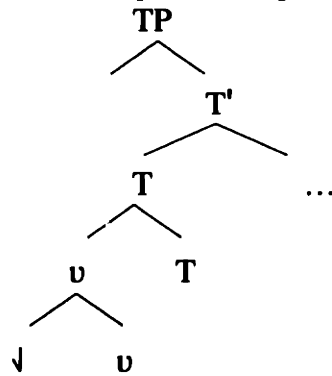
- (i) [b'a-tʒ] / [b'a-r-ə-tʒ]  
 [b'a-s] / [b'a-r-ə-s]  
 [b'a] + infinitive  
 [b'a-m] / [b'a-r-ə-m]  
 [b'a-w] / [b'a-r-ə-w]  
 [b'a-n] / [b'a-r-ə-n]

## (58) Past tense forms

|         | I Conjugation | II Conjugation | III Conjugation |             |
|---------|---------------|----------------|-----------------|-------------|
|         | 'cantar'      | 'témer'        | 'sortir'        | 'unir'      |
| Impf.   | kənt-'a-b-ə-Ø | təm-'i-Ø-ə-Ø   | surt-'i-Ø-ə-Ø   | un-'i-Ø-ə-Ø |
| Ind.    | kənt-'a-b-ə-z | təm-'i-Ø-ə-z   | surt-'i-Ø-ə-z   | un-'i-Ø-ə-z |
| [+Past] | kənt-'a-b-ə-Ø | təm-'i-Ø-ə-Ø   | surt-'i-Ø-ə-Ø   | un-'i-Ø-ə-Ø |
| [-Perf] | kənt-'a-b-ə-m | təm-'i-Ø-ə-m   | surt-'i-Ø-ə-m   | un-'i-Ø-ə-m |
| [-Subj] | kənt-'a-b-ə-w | təm-'i-Ø-ə-w   | surt-'i-Ø-ə-w   | un-'i-Ø-ə-w |
|         | kənt-'a-b-ə-n | təm-'i-Ø-ə-n   | surt-'i-Ø-ə-n   | un-'i-Ø-ə-n |
| Impf.   | kənt-'e-s     | təm-'e-s       | surt-'i-s       | un-'i-s     |
| Subj.   | kənt-'e-s-i-z | təm-'e-s-i-z   | surt-'i-s-i-z   | un-'i-s-i-z |
| [+Past] | kənt-'e-s     | təm-'e-s       | surt-'i-s       | un-'i-s     |
| [+Subj] | kənt-'e-s-i-m | təm-'e-s-i-m   | surt-'i-s-i-m   | un-'i-s-i-m |
|         | kənt-'e-s-i-w | təm-'e-s-i-w   | surt-'i-s-i-w   | un-'i-s-i-w |
|         | kənt-'e-s-i-n | təm-'e-s-i-n   | surt-'i-s-i-n   | un-'i-s-i-n |
| Simple  | kənt-'i       | təm-'i         | surt-'i         | un-'i       |
| Past    | kənt-'a-r-ə-z | təm-'e-r-ə-z   | surt-'i-r-ə-z   | un-'i-r-ə-z |
| [+Past] | kənt-'a       | təm-'e         | surt-'i         | un-'i       |
| [+Perf] | kənt-'a-r-ə-m | təm-'e-r-ə-m   | surt-'i-r-ə-m   | un-'i-r-ə-m |
|         | kənt-'a-r-ə-w | təm-'e-r-ə-w   | surt-'i-r-ə-w   | un-'i-r-ə-w |
|         | kənt-'a-r-ə-n | təm-'e-r-ə-n   | surt-'i-r-ə-n   | un-'i-r-ə-n |

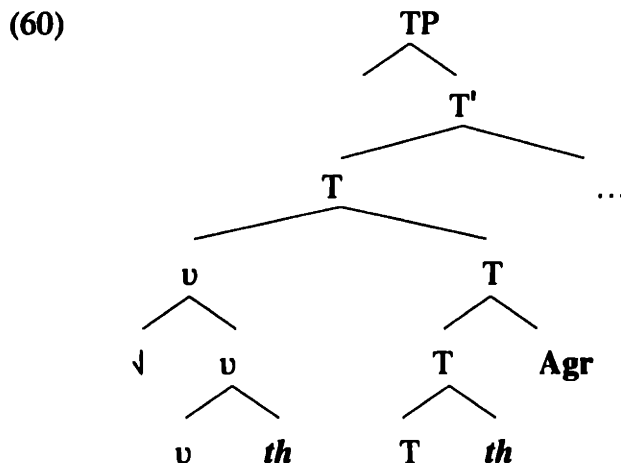
All of the past tense forms share the same syntactic structure as input to the morphology, the one depicted in (59). In the next subsection, we will see that the present tense also has the same structure. I assume that, unless a feature [+Future] is chosen for the computation, all the tense, aspect and mood features are combined into a single morpheme for the computational system in Catalan. Thus, in (59), the single node T is to be understood as Tense/Mood/Aspect.

(59) Input to Morphology (Past and Present)



This means that in the morphology, only a single morpheme serves as the locus for Vocabulary Insertion. Consequently, only one theme vowel will be required.

Once in the morphological component, the addition of morphemes required by the well-formedness conditions leaves us with the structure shown in (60). Recall that irrelevant structure is omitted.



Bearing this structure in mind, let us first consider the imperfect indicative. This structure and the vocabulary entries that we have proposed will give us the correct results, as shown in (61), with the second singular form of the verbs *cantar*, *unir* and *sortir*.

|      |     |             |        |      |             |                     |
|------|-----|-------------|--------|------|-------------|---------------------|
| (61) | (a) | [kənt'abəs] | 2sg II |      |             |                     |
|      |     | [v          | v      | th   | T           | th                  |
|      |     |             |        | [-α] | [+Past][-α] | Agr]                |
|      |     |             |        |      |             | [+Part, -Auth, -Pl] |
|      |     | kant        | Ø      | a    | b           | a                   |
|      |     |             |        |      |             | z                   |



|     |            |          |        |              |                     |
|-----|------------|----------|--------|--------------|---------------------|
| (b) | [surt'iəs] | [un'iəs] | 2sg II |              |                     |
|     | ∇          | v        | th     | T            | th                  |
|     |            |          | [+α]   | [+Past] [-α] | [Agr]               |
|     |            |          |        |              | [+Part, -Auth, -Pl] |
|     | surt       | Ø        | i      | Ø            | a                   |
|     | un         | Ø        | i      | Ø            | a                   |
|     |            |          |        |              | z                   |
|     |            |          |        |              | z                   |

Yet, there is a problem with respect to the theme vowel of the *v* node in the second conjugation verbs. The forms of the imperfect indicative display an [i], as in [təm'iə], which, according to our vocabulary entries, is the elsewhere phonological exponent for the third conjugation. As we saw in (33) above, this is well accounted for within this system, repeated in (62). That is, the interaction of the *MH* with the degree of markedness of the environment turns a doubly marked theme into a marked theme.

- (62) (a) [təm'iəs] 2sg II  
 (b) [+β] → [Ø] / \_\_\_\_ [+Past, -Perf, -Subj]

Let us now turn to the imperfect subjunctive. On the one hand, we have a suffix [s] that realizes the features [+Past, +Subj]. On the other hand, I propose that the feature [+Subj] requires the theme vowel of the Tense head to belong to the third conjugation, i.e. to be [+α]. Thus, there is a rule of the form shown in (63(b)). In this case too, this rule follows from our proposal, whereby the unmarked theme becomes marked in a marked environment.<sup>43</sup>

<sup>43</sup> This rule deserves some attention. Notice that, in fact, the imperfect subjunctive has the features [+Past, +Subjunctive], i.e. in our terms this is in fact a specially marked environment, and not simply a marked context as we have said above in the text. This rule also takes place in the present subjunctive, where the tense features [-Past, +Subjunctive] specify the tense node as marked. The question is: why do we have /surt'isiz/ instead of /surt'isez/? I think that a possible answer may be given by looking at the different Catalan dialects. In some dialects, the theme vowel following the T node is only affected by the [+Subj] feature, as in Central Catalan. But in other dialects (Veny (1993)), as in Ibizan or some North-Western varieties, the same theme vowel is affected by both features, i.e. the theme vowel following T 'sees' both features, hence the context is considered to be doubly marked. This issue becomes even more interesting when we look at the theme vowel preceding the T node, i.e. the theme vowel taken by the *v* node. Below we will see that, in Central Catalan, the default vowel in that position is affected by the doubly marked context. North-Western varieties follow the same pattern in this case. But in Ibizan, the environment does not affect the default theme vowel preceding T. As it were, it seems that in the variety of Catalan that we are analyzing, a [+Past] feature that has already been realized by the insertion of a Vocabulary item cannot further determine a following theme vowel. But [+Subj] may affect Vocabulary Insertion in any direction (and, in fact, it always determines the *following* theme vowel). Although this is not a complete answer to the issue, I think that this is the right way to look at it.

- (b) [ ]  $\rightarrow$  [+ $\alpha$ ] / [+Subj] \_\_\_\_\_

This rule will yield the correct result, as shown in (64(b)) for the second singular form [surt'isis].

- |     |                |             |               |                |               |                     |
|-----|----------------|-------------|---------------|----------------|---------------|---------------------|
| (b) | [ $\downarrow$ | v           | th            | T              | th            | Agr]                |
|     |                |             | [+ $\alpha$ ] | [+Past, +Subj] | [+ $\alpha$ ] | [+Part, -Auth, -Pl] |
|     | surt           | $\emptyset$ | i             | s              | i             | z                   |

Now, we must address the question of what happens to the first and third person singular, such as [surtís(\*i)], where the theme /i/ required by the subjunctive is absent. A phonological explanation does not seem promising. If we were to say that a final unstressed vowel is deleted, then we should have to explain why this does not occur in the imperfect indicative for the same forms (see the table in (58) above). To say that an unstressed [i] is deleted in final position would be even more stipulative, since there are many words ending in unstressed [i] in Catalan, e.g. *tesi* 'thesis', *dimoni* 'devil', etc. Besides, we do not want to have non-independently motivated phonological rules. Thus, we must find a morphological explanation. The only possibility we are left with is to assume that in this environment, T and Agr fuse into a single node, and, as in the future, the theme vowel can no longer be realized. Thus, these forms can be seen as the result of an exceptional application of the process of fusion, which only applies in the unmarked environment.

Consider the forms of the imperfect subjunctive in the first conjugation, i.e. for the verb *cantar*. The theme vowel following the root (i.e. the one taken by the *v* node) is not the expected one, but the elsewhere phonological exponent of the second conjugation. As shown in bold in (65(c)), there is a feature mismatch. As we saw in (32) above,

repeated here as (65), this theme vowel allomorphy is well accounted for in our analysis.<sup>44</sup>

(65) (a) [kənt'esis]

(b)  $[-\alpha] \rightarrow [+ \beta] / \text{ \_\_\_\_ } [+Past, +Subj]$

|     |       |   |             |                  |             |                       |
|-----|-------|---|-------------|------------------|-------------|-----------------------|
| (c) | [N    | u | th          | T                | th          | Agr]                  |
|     |       |   | $[-\alpha]$ | $[+Past, +Subj]$ | $[+\alpha]$ | $[+Part, -Auth, -Pl]$ |
|     | *kant | Ø | a           | s                | i           | z                     |

The rule in (65(b)) captures the fact that first and second conjugation behave in the same way in this environment, i.e. the distinction between them is neutralized. Notice that this rule runs counter to the traditional assumption that it is the second conjugation that patterns either with the third or with the first conjugations with respect to the theme vowel –apart from having its own theme in some environments. The neutralization process that we generally see is the one in which what is marked becomes unmarked. According to this rule, however, a default theme becomes a marked one in a doubly marked environment. This simply follows from the *Markedness Hierarchy*, and its interaction with the degree of markedness of the context.

Let us now consider the Simple Past forms. Here again, the first and third person singular forms pose a problem. The other forms behave as expected for all conjugations, as shown in (66) for the second person singular of *cantar*.

(66) [kənt'arəs]

|      |   |             |                  |             |                       |
|------|---|-------------|------------------|-------------|-----------------------|
| [N   | u | th          | T                | th          | Agr]                  |
|      |   | $[-\alpha]$ | $[+Past, +Perf]$ | $[-\alpha]$ | $[+Part, -Auth, -Pl]$ |
| kant | Ø | a           | r                | a           | z                     |

As for the puzzling forms, we cannot account for them in the same way as we did before for the imperfect subjunctive, since in this case the tense morpheme is also deleted. These are highly idiosyncratic forms, but the framework that we have adopted and the proposals that we have made provide the means to account for these special cases. I propose that a rule impoverishes the tense node in this context. Since the rule is

<sup>44</sup> See the previous footnote.

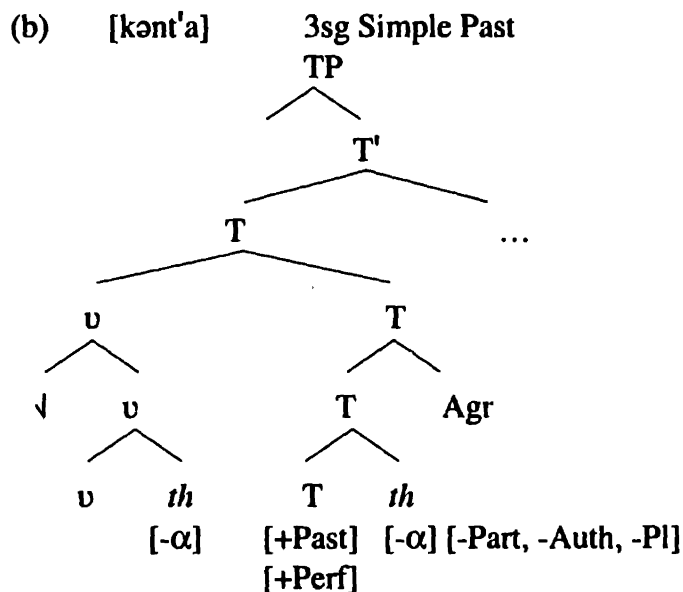
triggered by the agreement features, I assume that the rule deletes the T node that is the sister to the Agr node in the context of first and third persons.<sup>45</sup> This is the same kind of rule that we find in the present tense. Notice crucially that the higher T node in (67(c)) is still present in the structure after the application of this rule. This will be relevant for the analysis of stress to be developed in section 5. In (67), I exemplify the derivation of the third person singular form of *cantar*.

- (67) (a) Impoverishment rule  

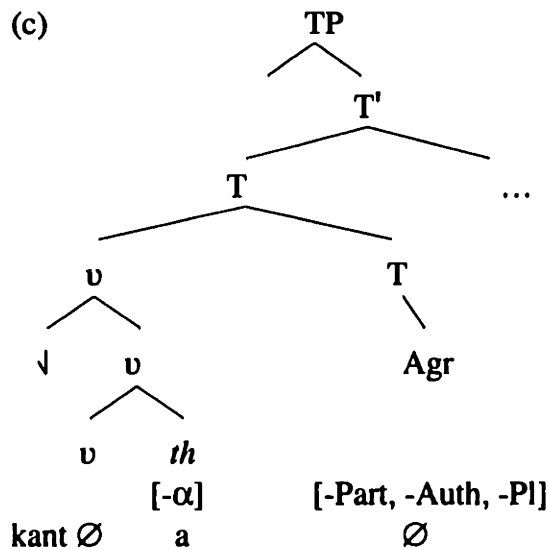
$$T \rightarrow \emptyset / \text{---} \begin{cases} \{-\text{Part}, -\text{Auth}\} \} [-\text{Pl}] \\ \{+\text{Part}, +\text{Auth}\} \end{cases}$$
  

$$|$$
  

$$\{+\text{Past}, +\text{Perf}\}$$



<sup>45</sup> That these data are best accounted for by deleting the T node was suggested to me by Ken Wexler (p.c.).



There is still a problem, however. This account fails to capture the fact that in both tenses, IS and SP, first and third person singular behave in a similar way.<sup>46</sup> Moreover, the agreement features that we have assumed so far, namely  $[\pm\text{Participant}, \pm\text{Author}]$  are not appropriate for relating the first and the third persons, a correction we need for the rule in (67(a)) above. I leave this issue for further research.

There still remains the question of the first person theme vowel /i/. Notice that it is the same for all conjugations, which is a clear sign that this form is highly idiosyncratic. We will need a morphological rule with the effect of collapsing the first person singular form for all conjugations to class III. The evidence for assuming that /i/ is here the theme vowel and not, say, a tense morpheme, is provided by our analysis of stress (see section 5 below). I propose the Readjustment rules in (68) below to account for this neutralization. (68(a)) will account for the second conjugation verbs, while (68(b)) accounts for the first conjugation verbs.

- (68) (a) Impoverishment rule  
 $[+\beta] \rightarrow \emptyset / \text{ \_\_\_ } [+Past, +Perfect, +Participant, +Author, -Pl]$
- (b) Redundancy Rule  
 $[ ] \rightarrow [+α] / \text{ \_\_\_ } [+Past, +Perfect, +Participant, +Author, -Pl]$

<sup>46</sup> As I mentioned in footnote 35, so far we have been assuming that the imperfect subjunctive is not specified for the feature [Perfect]. Given that the imperfect subjunctive seems to pattern with the simple

Notice that the rules in (68) above will have to apply prior to the Impoverishment rule in (67(a)), otherwise the context for the application of these rules will never be met. However, this ordering needs to be stipulated, because the context of (68) is met after VI of the root, while the context of the Impoverishment rule in (67(a)) is syntactic. This will not undermine our generalizations, since these cases are very idiosyncratic and specific. It is thus expected that they do not follow the generalizations underlying the verbal system as a whole.

Before concluding this subsection, let us compare the imperfect indicative with the conditional in (69). Consider the strings in bold.

|      |                   |                        |
|------|-------------------|------------------------|
| (69) | Conditional       | Imperfect Indicative   |
|      | kənt-ə-'r-i-Ø-ə-Ø | kənt-' <b>a-b</b> -ə-Ø |
|      | təm-Ø-'r-i-Ø-ə-Ø  | təm-'i-Ø-ə-Ø           |
|      | surt-i-'r-i-Ø-ə-Ø | surt-'i-Ø-ə-Ø          |

It has been traditionally assumed that the conditional is built by adding the endings of the verb *haver* 'have' in the imperfect indicative to the infinitive of the verb. I agree with Mascaró's (1983) arguments against such an analysis for Catalan. However, his analysis fails to relate the two forms. In our analysis, the fact that the conditional is for instance [kənt-ə-'r-i-Ø-ə-Ø] and not [kənt-ə-'r-a-b-ə-Ø] is accounted for by the effect of the *Markedness Hierarchy* in the form of a Readjustment Rule (11(a)) that marks the default theme in a marked context. After the application of this rule, Vocabulary Insertion of the appropriate phonological exponents follows, i.e. the default past morpheme is inserted instead of a more specified one; T takes the default theme vowel, and the corresponding agreement suffixes are finally inserted. The key point is that in our analysis, the /i/ of the conditional and the /i/ of the imperfect indicative are instances of one and the same entity, namely the default phonological exponent of the third conjugation verbs. The difference between them is that they belong to different functional heads, M in the conditional and v in the imperfect indicative. Furthermore, the different schwas that appear in both tenses are also instances of one and the same entity, namely

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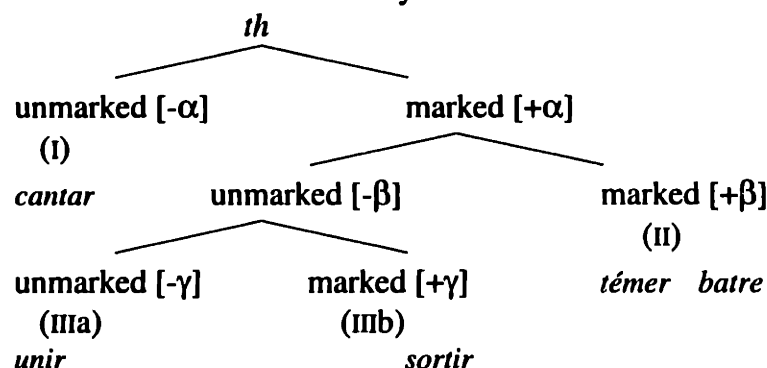
past in some way for the first and third persons, and not with the imperfect indicative, it is possible that this is due to the fact that they share the feature [Perfect].

the default theme vowel taken by the node T in both cases. Hence, our analysis captures the fact that the conditional patterns with both the future and the imperfect indicative.

### 4.3. Present Tense

Before entering into the proper analysis of the present tense forms, we must elucidate and formally state the difference between the *sortir* and the *unir*-type verbs, since this question now becomes relevant. As was first proposed in Fabra's Grammar (1912), previous approaches (Wheeler (1979), Mascaró (1983,1986)) consider the third conjugation as divided into two subclasses, IIIa and IIIb. Our claim is that this is unnecessary for two reasons. On the one hand, this multiplies the number of verb classes. A look at the whole paradigm is enough to see that these forms should be treated as instances of the same conjugation, differing in just some forms of the present tense. On the other hand, and more importantly, in the present tense, such a division fails to capture the obvious relationship between both verb types, i.e. whenever *unir* takes -eʃ-, *sortir* takes 'nothing'.<sup>47</sup> Thus, the *unir*-type verbs are the normal case, i.e. the default or unmarked case, as proposed in our *Markedness Hierarchy*, repeated in (70) below.

#### (70) Theme Vowel Markedness Hierarchy



According to our *Markedness Hierarchy*, the *sortir*-type verbs bear the marked feature [+γ], and that is what makes them differ from the *unir*-type verbs. The motivation for this proposal comes from two facts. On the one hand, the *unir*-type verbs are the majority in the third class and when a new verb is coined for this class, it patterns with *unir*, not with *sortir*. On the other hand, consider the examples in (71).

<sup>47</sup> I will discuss the exact meaning of this 'nothing' below.

- (71) (a) [muŋ'i] [m'upu] → [muŋ'ɛʃu] 'to milk, I milk'
- (b) [mənt'i] [m'entu] → [ɾnənt'ɛʃu] 'to lie, I lie'
- (c) [sənt'i] / [s'entu] but [əsənt'i] / [əsənt'ɛʃu] / \*[əs'entu]  
'to feel, to hear/ I feel, I hear' 'to assent, I assent'

As shown in (71(a)-(b)) some *sortir*-type verbs have been reinterpreted as belonging to the *unir*-type verbs, i.e. in our analysis, they have lost the marked feature [+γ]. Furthermore, as illustrated by (71(c)), verbs derived from *sortir*-type verbs tend to be regularized as well (in some cases, both forms are available for some speakers). These cases provide support for the assumption that *sortir*-type verbs are the marked ones. They are idiosyncratic, i.e. the child must learn that these verbs have some property that makes them differ from the regular third conjugation, but only in the present tense, and here only in some forms but not all. Furthermore, we will show that this distinction based on a feature difference is part of a wider generalization in the present tense.

After this clarification, we can turn to the analysis of the present tense. Consider the data in (72).

(72) Present tense forms

|                    | I Conjugation | II Conjugation | III Conjugation |              |
|--------------------|---------------|----------------|-----------------|--------------|
|                    | 'cantar'      | 'témer'        | 'sortir'        | 'unir'       |
| Ind.               | k'ant-u       | t'em-u         | s'urt-u         | un-'ɛʃ-u     |
| [-Past]            | k'ant-Ø-ə-z   | t'em-z         | s'urt -z        | un-'ɛʃ-z     |
|                    | k'ant-Ø-ə-Ø   | t'em-Ø         | s'urt -Ø        | un-'ɛʃ-Ø     |
|                    | kənt-'ɛ-m     | təm-'ɛ-m       | surt-'i-m       | un-'i-m      |
|                    | kənt-'ɛ-w     | təm-'ɛ-w       | surt-'i-w       | un-'i-w      |
|                    | k'ant-Ø-ə-n   | t'em-ən        | s'urt -ən       | un-'ɛʃ-ən    |
|                    |               |                |                 |              |
| Subj.              | k'ant-Ø-i-Ø   | t'em -Ø-i-Ø    | s'urt -Ø-i-Ø    | un-'ɛʃ-Ø-i-Ø |
| [-Past]<br>[+Subj] | k'ant-Ø-i-z   | t'em -Ø-i-z    | s'urt -Ø-i-z    | un-'ɛʃ-Ø-i-z |
|                    | k'ant-Ø-i-Ø   | t'em -Ø-i-Ø    | s'urt -Ø-i-Ø    | un-'ɛʃ-Ø-i-Ø |
|                    | kənt-'ɛ-m     | təm-'ɛ-m       | surt-'i-m       | un-'i-m      |
|                    | kənt-'ɛ-w     | təm-'ɛ-w       | surt-'i-w       | un-'i-w      |
|                    | k'ant-Ø-i-n   | t'em -Ø-i-n    | s'urt -Ø-i-n    | un-'ɛʃ-Ø-i-n |
|                    |               |                |                 |              |



At first sight, the data in (72) seem very puzzling, contrasting with the more systematic paradigms we have analyzed so far. However, after closer examination the following generalizations emerge.

(73) (a) First and second person plural are neutralized in the present tense, i.e. they surface identically in the indicative and the subjunctive.

(b) Precisely in those forms, the first and second plural, a stressed theme vowel appears following the root. Moreover, in the third conjugation, the theme vowel that appears in these forms is the elsewhere theme.

(c) Where the third conjugation has the theme vowel /εʃ/, the other conjugations (and the *sortir*-type verbs) have nothing, i.e. no theme.

To account for these generalizations, we must first answer the following questions.

(74) (a) What is the [ə] that appears in the second and third singular forms of the verb *cantar*? Is it the same Vocabulary item that appears in the third person plural for all conjugations?

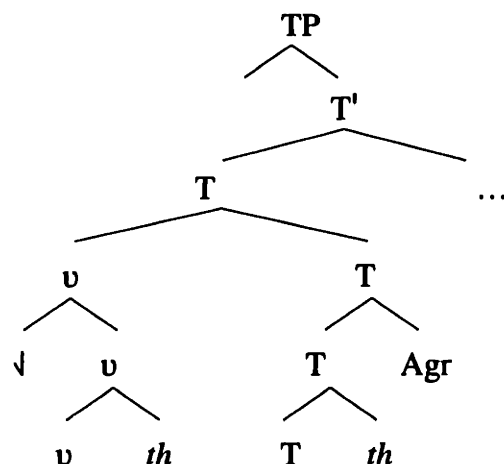
(b) What is the form -εʃ- appearing in some verbs of the third conjugation? And what is its distribution?

(c) Why is there no theme vowel immediately following the root in the forms other than first and second person plural? Furthermore, leaving aside the indicative of the first conjugation and the *unir*-type verbs, why is there no theme vowel in the indicative? That is, neither the *v* node, nor the *T* node seem to take any theme.

(d) What makes first and second person plural so special?

Before starting to solve these questions, let us look at the structure. As I already mentioned in the previous section, the syntactic structure that enters into the morphological component in the present tense is the same as the one given for the past tense. After the application of the well-formedness conditions, we obtain the structure we saw in (60) above, repeated here as (75).

(75)



Now, recall our analysis of the future. We proposed that Tense and Agr fuse in the morphology in the unmarked environment, i.e. in the context of [-Past]. This is the same context we encounter in the present tense. Therefore, we expect the same operation of fusion to take place here. The prediction of our analysis is borne out in the present indicative, but not in the present subjunctive. This is in fact not surprising. In the present subjunctive, the T node has the features [-Past, +Subjunctive]. Hence, it is not an unmarked environment in our terms due to the presence of the marked subjunctive feature. Consequently, the operation of fusion is blocked.

Let us now turn back to the questions stated in (74) above. Consider (74(a)), which was concerned with the schwa of the second and third singular forms of the present indicative in the first conjugation. I sketch some possible solutions and the problems they pose in (76).

(76) (a) Suppose that [ə] is the first conjugation theme vowel /a/ (the default theme) taken by the head *v*. In the best case, a phonological rule would delete it when followed by another vowel in the first person singular, and our vocabulary entries would ensure that in the first and second plural the allomorph /ε/ gets inserted.

This analysis poses some problems. First, if we compare the first conjugation with the second and the third, we not only would have to assume that they are different (which is actually true), but we would have to explain the different sources of the schwa in the third plural forms. Notice that all conjugations have the same [ə] preceding the agreement

vowel [n].<sup>48</sup> But there is a still more conclusive evidence related with stress. Since I will deal extensively with the question of stress in section 5, for the moment I will just draw the reader's attention to the relevant fact. Notice that there is no theme vowel in the whole verbal paradigm that appears unstressed in that position, i.e. immediately following the root, unless it is *followed* by stress.

(b) Assume that [ə] is the tense morpheme (as proposed by Mascaró (1983, 1986) and further assumed by Sifre (1995) and many others). In that case, we would have to assume tense allomorphy behaving in a very arbitrary way, i.e. [ə] appears in three forms of the first conjugation, but only in one form in the other conjugations. As M-R Lloret (p.c.) pointed out to me, these analyses are forced to say that this [ə] is a tense morpheme. This is because they assume that the traditional theme vowel is a stressed morpheme. Since in these cases it appears unstressed, it cannot be a theme vowel for them. The only position that remains available in their analyses is the tense position. Hence, they are forced to assume arbitrary tense allomorphy.

(c) Imagine that [ə] is the default theme vowel, but crucially the one required by T. We know that the first conjugation behaves in a different way with respect to the present tense. In this case, the difference would be that T and Agr would not fuse in the cases at hand. This, of course, is rather arbitrary, but it is a morphological idiosyncrasy of the conjugation, and not of Tense.

As for the third person plural in all conjugations, there are again three possibilities to account for it. We can take [ən] to be the realization of the fused T/Agr in the present indicative, with the vocabulary entry shown in (77).

(77) /ən/ ↔ [-Past, -Subj, +Plural]

Or, we could say that for all conjugations, T and Agr do not fuse in the context of third person. In this case, the schwa of the second and third singular forms of the first conjugation and the one found in the third plural forms of all verbs would be the same, namely an instance of the default theme vowel.

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<sup>48</sup> We could assume that [ə] in the second conjugation is the reduced theme suffix [e]. But, there is no way in which we can explain the form [surtən] in these terms.

Or still, it might be that ə-insertion, i.e. epenthesis, occurs in the third person plural either to break an unpronounceable sequence or as a kind of prosodic requirement. Lloret (p.c.) has pointed out to me that this possibility of having an epenthetic schwa inserted in the third person plural has already been suggested in the literature on Catalan, for the second and third conjugations. I am unable to provide a survey of the relevant literature on this issue here, but the proposal seems well-supported by dialectal facts (mainly from Alguerès, as Lloret further pointed out). These epenthesis analyses, however, continue to assume that the schwa of the first conjugation is a tense allomorph.

To conclude this part of the discussion, notice that these are rather idiosyncratic facts. Thus, any solution will perforce have to be arbitrary. The goal is to find the least arbitrary solution under a given proposal, i.e. the one that is least costly. For the remainder of the paper, I will assume that the first conjugation is special in that it does not allow fusion of T and Agr in the morphology. For the third person plural of the other conjugations, I will assume that the schwa is epenthetic, since that seems to me the best move. The latter cases will not pose any problem for our analysis.<sup>49</sup>

Let us now turn to the remaining questions stated in (74) above. I think that the three questions are closely interrelated. First of all, recall that, following Mascaró (1983, 1986), I take the suffix /ɛʃ/ to be a theme vowel, since it appears in the same position as the other theme vowels.<sup>50</sup> The vocabulary entries that realize the features for the third conjugation are the ones given in (10(b)) above, repeated here as (78).

- (78) /ɛʃ/ ↔ [-γ] / \_\_ [-Past]  
 /i/ ↔ [+α] / <elsewhere>

Now, notice that these Vocabulary items predict that the more specific item /ɛʃ/ will also win the competition for insertion in the context of first and second person plural, which is obviously wrong. On the other hand, the other conjugations (and the *sortir*-type

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<sup>49</sup> Notice that in the case of *unir*, we know that in the second person singular, [un'ɛʃəs], the schwa is epenthetic (see Mascaró (1983)). Thus, for the third person plural, [un'ɛʃən], the most plausible analysis is to treat the schwa as being epenthetic too, since the string [ʃn] is illicit in Catalan.

<sup>50</sup> Although diachronically meaningful, there is no synchronic meaning associated with /ɛʃ/.

verbs), which do not have a theme vowel specified for insertion in the context of present tense, have no theme vowel in those cases where /ɛʃ/ appears. However, in those conjugations a theme vowel also appears in the first and second person plural. The correlation is therefore evident, as shown in (79) for the second person singular and plural.

- (79) [s'urt-s]      [surt-'i-w]      vs.      [un-'ɛʃ-(ə)s]      [un-'i-w]  
       [t'em-s]      [təm-'ɛ-w]

Thus, in the third conjugation, although /ɛʃ/ is the more specific item, in the first and second person plural forms the elsewhere phonological exponent /i/ is inserted instead. This is a clear example of impoverishment. That is, a "*retreat to the general case*, for a more highly specified Vocabulary item loses out to one that is less specific, more general" (Halle & Marantz (1994:278)). Therefore, since /ɛʃ/ is specified for being inserted in the context of [-Past], we need an Impoverishment rule that deletes this feature, such that this context will no longer be met and the elsewhere theme vowel will be correctly inserted in those forms. I propose the rule stated in (80).

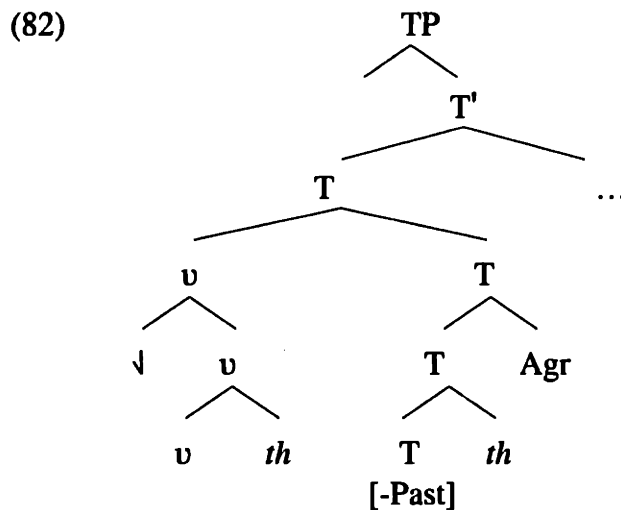
- (80) Impoverishment rule 1  
       T → Ø / \_\_\_\_ [+Participant, +Plural]  
       |  
       [-Past]

Notice that this rule resembles the one proposed in (67(a)) above for the analysis of first and third person singular in the simple past. As it was proposed there, this rule must be understood as follows: a [-Past] T node that is sister of a [+Participant, +Plural] Agr node is impoverished. The reason for deleting the entire T node, instead of just the tense feature [-Past] is better understood when we look at the Present Subjunctive. Notice that if we had a rule just deleting the [-Past] feature, in the Present Subjunctive we are still left with the presence of the [+Subj] feature, as shown in (81).

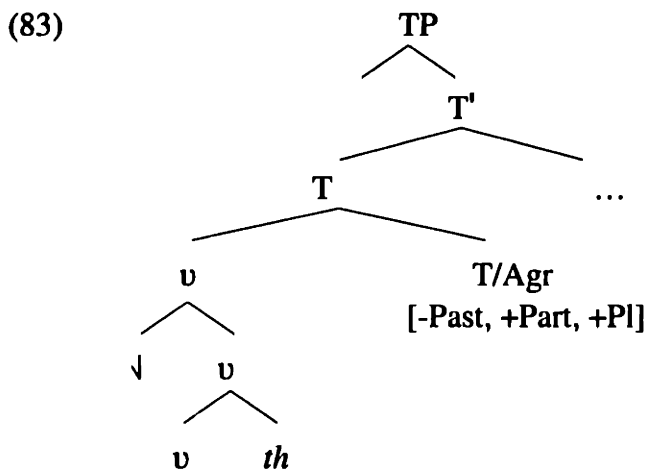
- (81) [N      v      th      T      th      Agr]  
       [-α]    [-Past, +Subj] [+α]      [+Part, +Auth -Pl]  
       \*kant Ø      ɛ      i      m

In previous drafts of this work, I proposed that the subjunctive feature would be deleted as well as a result of the application of the same rule because it is (hierarchically) dependent on the tense feature. However, assuming that what is impoverished is the T node that is sister of Agr, the issue of the [Subj] feature does not even arise. Moreover, the process is simplified, since we do not need to assume that after the impoverishment of the tense features T and Agr are fused into a single node in the present subjunctive.

Now, consider again the present indicative and the syntactic structure that we have proposed for these forms in (82)



This is the structure that results from the application of our well-formedness conditions. Now, we have proposed that T and Agr fuse in the unmarked context, which is determined by T. Thus the structure above results in the structure in (83).



Given this structure, it seems that our Impoverishment rule in (80) will not apply, for T and Agr are no longer sisters. In order to avoid this result, I will assume that in this case, the Impoverishment rule in (80) is ordered first, thus bleeding the fusion operation.

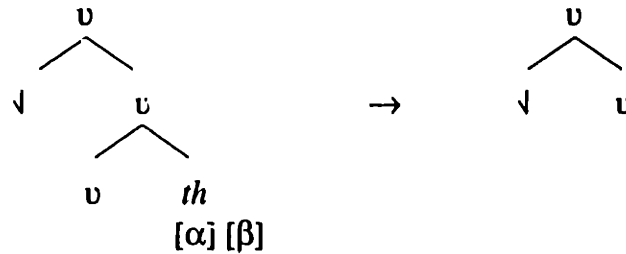
We are still left with the issue of the presence versus absence of a theme vowel immediately following the root, i.e. the theme taken by *v* in our analysis, in the forms other than first and second person plural. Descriptively, it seems that in the absence of a context-specific Vocabulary item, such as /*ε*/ for the third conjugation, no theme vowel may be inserted in the context of [-Past]. The question is whether we have a zero-morpheme that realizes each theme vowel in this context or whether the position is not there for insertion at all, i.e. whether the position is deleted. Our claim is that the position is deleted through the application of the Impoverishment rule shown in (84). The effect of this rule is illustrated in (85) for the first and second conjugations. This rule says that any value of the feature [ $\alpha$ ] and any value of the feature [ $\beta$ ] in the position adjoined to the functional head *v* is deleted in the context of [-Past]. Recall that when the positive value of a feature is deleted, UG provides automatically the negative value for that feature, i.e. the default one. But when any value of a feature is deleted, no default can be inserted. Furthermore, since this rule is deleting the feature [ $\alpha$ ], i.e. any value of [ $\alpha$ ], the *Markedness Hierarchy* will not be able to provide a default feature either.

- (84) Impoverishment rule 2  

$$\begin{array}{c} \lceil [\alpha] \rceil \\ \lfloor_v [\beta] \rfloor \end{array} \rightarrow \emptyset / \text{ \_\_\_ } [-\text{Past}]$$

That is, the key effect of this rule is that no Redundancy rule can rescue these positions by any means. This is what happens in (85) for the first and second conjugations. The primitive features that build these conjugations are precisely [ $\alpha$ ] and [ $\beta$ ].

(85) First and second conjugations



The claim is that, for the first and second conjugations, when the theme feature is deleted, the position is deleted as well. However, this is not a stipulation. It follows from the fact that this position is purely morphological, i.e. it is a position projected in the morphology by a morphological well-formedness requirement. The only content that it has are morphological features. Once these features are deleted the position automatically evaporates. Observe that the context of this rule, i.e. [-Past], is also met in the future forms. However, this rule will not apply there, since the presence of the intervening Mood node will block it, respecting strict locality conditions, as shown in (86).

(86)

|      | target |      | intervening<br>node |      | trigger                    |
|------|--------|------|---------------------|------|----------------------------|
|      | ↓      |      | ↓                   |      | ↓                          |
| [∅   | u      | th   | <b>M</b>            | th   | T/Agr]                     |
|      |        | [-α] | <b>[Fut]</b>        | [-α] | [-Past, +Part, -Auth, -Pl] |
| kant | ∅      | a    | <b>r</b>            | a    | z                          |

Now, what is the effect of this Impoverishment rule in the third conjugation? Recall again the features that realize the theme vowels of this conjugation, repeated in (87).

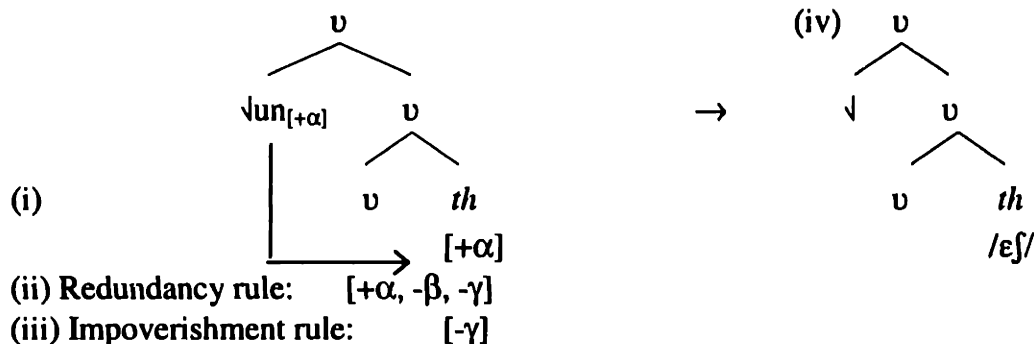
- (87) /ɛʃ/ ↔ [-γ] / \_\_ [-Past]  
 /i/ ↔ [+α] / <elsewhere>

The result of the application of this Impoverishment rule is shown in (88) for the third conjugation. For *unir*-type verbs, the theme position is sensitive to the feature information provided by the root. Automatically, a Redundancy rule further specifies the terminal node, as in (ii) below. When the above stated Impoverishment rule applies, a [-γ] feature remains in the terminal node, which, given our Vocabulary items, is realized as

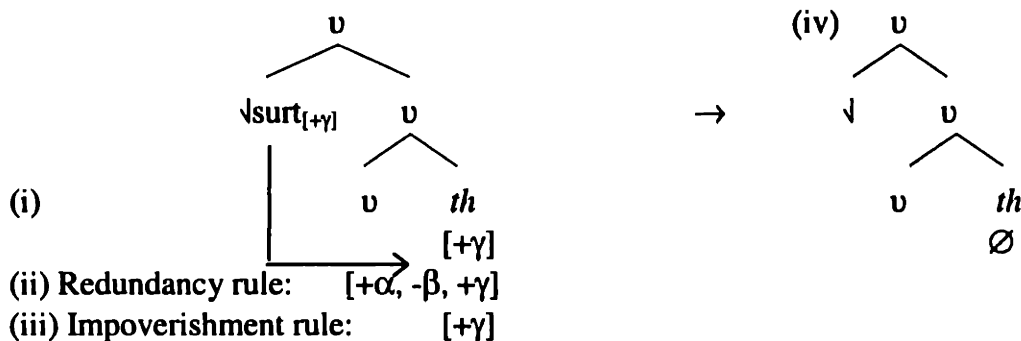


/ɛʃ/ in the context of [-Past]. The same process takes place for *sortir*-type verbs. The crucial difference is that when the Impoverishment rule applies the feature that remains in the terminal node is [+γ]. There is no Vocabulary item realizing this feature, thus none can be inserted. As I have been assuming so far, UG provides a default zero spell-out for this position.

(88) (a) Third conjugation: *unir*-type verbs



(b) Third conjugation: *sortir*-type verbs



Notice that these two Impoverishment rules, 1 in (80) and 2 in (84) above, account for all the forms of all conjugations in the present tense regarding the presence versus absence of the theme vowel in the *v* node. Crucially, the application of Impoverishment rule 1 prevents Impoverishment rule 2 from applying to the first and second person plural. Hence, the interaction of the two rules will ensure that a theme vowel is inserted in those two plural forms, while the rest will not have a theme vowel in that position. Notice that the order of the rules need not be stipulated. While the context for the application of Impoverishment rule 1 comes from the syntax, the context for Impoverishment rule 2 is supplied by Vocabulary Insertion, since the theme features are

not available before. This means that since morphological features are inserted by VI, and VI is context-sensitive, morphological operations must be allowed to apply cyclically as well, as we have assumed.

Now, recall our vocabulary entries for first and second conjugation theme vowels, repeated in (89).

- (89) (a)    /u/        ↔ [+β] / \_\_ [+Participle, +Past]  
               /Ø/        ↔ [+β] / \_\_ [Future]  
               /e/        ↔ [+β] / <elsewhere>
- (b)    /ɛ/        ↔ [-α] / \_\_ [+Part, +Plural]  
                       /a/        ↔ [-α] / <elsewhere>

These vocabulary entries provide us with the right results for the first conjugation forms [kənt'ɛm] and [kənt'ɛw]. However, for the second conjugation forms [təm'ɛm] and [təm'ɛw], there is no [ɛ] realizing the feature [+β]. If we posit a rule that neutralizes the two conjugations in this context, as we did before for the imperfect indicative or the imperfect subjunctive, an additional problem seems to arise. That is, in this case, the second conjugation patterns with the first in only these two forms, but differs from the first conjugation in the second and third person singular forms. Now, our conception of the *Markedness Hierarchy* provides us with the right explanation. The default theme vowel [-α] is the completely unmarked one, while the theme vowel [+β] is the most marked. Up to now, we have already made a three-way distinction between unmarked/marked/doubly marked. Thus, in this case, what we need is a context that allows a doubly marked theme vowel to become completely unmarked.

Indeed, this is the context we find. Recall that our Impoverishment rule in (80) deletes the T node in the context of first and second person plural. Hence, the feature specification of the T node becomes completely unmarked,<sup>51</sup> and it is precisely in these two forms that first and second conjugations are neutralized. Therefore, we can state the rule in (90) to account for the second conjugation forms [təm'ɛm] and [təm'ɛw].

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<sup>51</sup> Recall that although the terminal node T is deleted, there is still a higher T node dominating Agr in our structures.

(90)  $[+\alpha, +\beta] \rightarrow \emptyset / \text{___ unmarked context}^{52}$

As a result of the application of this rule, and due to the structure of our *Markedness Hierarchy*, only the default theme vowel can be inserted, which is automatically provided by UG.

Before concluding this section, I want to make a final remark regarding the future and the present tenses. Compare the first and second plural endings in bold in (91).

|      |     |         |                       |                      |
|------|-----|---------|-----------------------|----------------------|
| (91) | (a) | Future  | kənt-ə-r- <b>'ε-m</b> | kənt-ə-r- <b>ε-w</b> |
|      | (b) | Present | kənt- <b>'ε-m</b>     | kənt- <b>'ε-w</b>    |

Other approaches fail to capture the fact that both tenses have the same endings in those forms, so that this is just fortuitous. From our analysis, however, it trivially follows that the [ε] appearing in both forms is an instance of one and the same theme vowel, as shown in (92) for the first person plural form of the future. The difference lies in that it is the theme vowel taken by different functional heads.

|      |     |      |   |      |                    |      |                     |
|------|-----|------|---|------|--------------------|------|---------------------|
| (92) | (a) | [N   | v | th   | M                  | th   | Agr]                |
|      |     |      |   | [-α] | [Fut]              | [-α] | [+Part, +Auth, +Pl] |
|      |     | kant | ∅ | a    | r                  | ε    | m                   |
|      | (b) | [N   | v | th   | Agr]               |      |                     |
|      |     |      |   | [-α] | [+Part, +Auth +Pl] |      |                     |
|      |     | kant | ∅ | ε    | m                  |      |                     |

In the next section we will see that our analysis can also capture the fact that stress is assigned to the same position in those forms for both tenses.

#### 4.4. Non-Finite Forms

I show in (93) the non-finite verbal forms, infinitive, gerund and participle, for all three conjugations.

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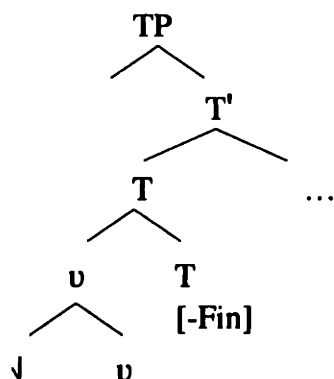
<sup>52</sup> This is a negative context that is hard to express formally. Whatever the formalization might be, it should be clear that 'unmarked context' here means completely unmarked.

(93) Non-finite forms

|            | I Conjugation | II Conjugation |              | III Conjugation |          |
|------------|---------------|----------------|--------------|-----------------|----------|
|            | 'cantar'      | 'témer'        | 'batre'      | 'sortir'        | 'unir'   |
| Infinitive | kənt-'a-r     | t'em-Ø-ə       | b'at-Ø-r (ə) | surt-'i-r       | un-'i-r  |
| Gerund     | kənt-'a-nt    | təm-'e-nt      | bət-'e-nt    | surt-'i-nt      | un-'i-nt |
| Participle | kənt-'a-d     | təm-'u-d       | bət-'u-d     | surt-'i-d       | un-'i-d  |

The syntactic structure that I propose for these forms is depicted in (94).

(94) Input to Morphology (Non-finite forms)<sup>53</sup>



In the morphology, only the functional head *v* will be subject to our well-formedness condition on functional heads. *T* will not undergo either of our two well-formedness conditions for two reasons. As for our well-formedness condition on *F*<sub>0</sub>, I assume that a non-finite *T* is a defective *T*, and this prevents it from being subject to this requirement. So, we need to reformulate this well-formedness condition so as to prevent its application in the non-finite verbal forms. This is shown in (95).

(95) Morphological well-formedness condition on *F*<sub>0</sub>'s (revised)  
Every non-defective *F*<sub>0</sub> requires a theme position

As for our well-formedness requirement on *T*, recall that this morphological condition is stated for finite *T*, so that it will simply not apply in these cases.

The first and the third conjugations pose no problem at all; they behave as expected given our Vocabulary items. However, the infinitive form of the second conjugation deserves some attention. I have proposed, following Mascaró (1983, 1986), two Vocabulary items that realize the features of the infinitive, repeated here in (96).

- (96) [ə] ↔ [-Finite] / [+β] \_\_\_\_ (for a particular set of roots)  
[r] ↔ [-Finite]

Mascaró (1983) provides convincing and detailed arguments for this distinction. Here I will summarize the main motivation for this proposal. In Catalan, there is a rule that deletes a final /r/ following a stressed vowel. Thus, an infinitival verbal form, when uttered in isolation, loses its final /r/. The evidence that this /r/ is underlyingly present comes from the examples in which an enclitic pronoun follows the infinitive. Consider the examples in (97).

- (97) [t'em-ə-w]    [b'atr-ə-w]    [kənt-'a-r-u]    [un-'i-r-u]  
*témer-ho*    *batre-ho*    *cantar-ho*    *unir-ho*  
'to fear it'    'to beat it'    'to sing it'    'to join it'

For *batre*-type verbs, the schwa is the result of epenthesis. However, for *témer*-type verbs, Mascaró shows that the schwa cannot arise through epenthesis. In the former, the string [tr] is a licit cluster, but in the latter [mr] is not. In this case, we should have [mər] after epenthesis, in which case, final r-loss would not be able to apply because /r/ is preceded by an unstressed vowel, and it would be a mystery that this /r/ does not surface when the verb is followed by a clitic.

Another possibility would be to treat this /ə/ as the reduced theme vowel of the second conjugation elsewhere phonological exponent, i.e. /e/. As we will see in the next section, this is not possible due to the stress system of the language.

Therefore, we are forced to posit an extra Vocabulary item that realizes the feature [-Finite] for a specific group of second conjugation verbs. /r/ is the default Vocabulary item for [-Finite] tense.

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<sup>53</sup> Notice that here I am assuming that in complex verbal forms such as *he cantat* 'I have sung' will be two T nodes, a finite and a non-finite one, and that the two root placeholders that are each merged with a *v* will

In (98), I illustrate with the forms of the first conjugation how our proposal accounts for non-finite forms.<sup>54</sup>

- (98) (a) 

|      |   |      |                     |
|------|---|------|---------------------|
| [N   | v | th   | T]                  |
|      |   | [-α] | [-Fin, -Participle] |
| kant | Ø | a    | r                   |
- (b) 

|      |   |      |                            |
|------|---|------|----------------------------|
| [N   | v | th   | T]                         |
|      |   | [-α] | [-Fin, +Participle, -Past] |
| kant | Ø | a    | nt                         |
- (c) 

|      |   |      |                            |
|------|---|------|----------------------------|
| [N   | v | th   | T]                         |
|      |   | [-α] | [-Fin, +Participle, +Past] |
| kant | Ø | a    | d                          |

To sum up, in this section I have provided a syntactic analysis of the constituent structure of Catalan verbs that accounts for all the puzzles posed by these data.

The next section deals with an immediate implication of this analysis for the stress system in the verbal environment. This will, in turn, have significant consequences for the nominal morphophonology, which will be the topic of section 6.

## 5. Stress Assignment

In this section I will show that our analysis of the Catalan verbal forms provides a better understanding of the position of stress in the verbal environment. Moreover, our proposal makes stress a unified phenomenon that is completely predictable for verbs.

Stress in Catalan (and in other Romance languages as well) is usually taken to be highly idiosyncratic and lexically determined. If we consider the examples in (99) below, it seems that no generalization can be drawn. I have syllabified the examples.

- (99) (a) Stress falls on the root → word has stress on the penultimate syllable
- |          |         |         |
|----------|---------|---------|
| 'kan-təz | 'te-miz | 'ba-tin |
| PI-2sg   | PS-2sg  | PS-3pl  |
- (b) Stress falls on the root → word has stress on the final syllable

---

undergo cyclic head-to-head movement.

<sup>54</sup> The second conjugation has a great number of irregular participles. As I have done so far, I will leave irregular forms for further research.

|        |        |
|--------|--------|
| 'temz  | 'surtz |
| PI-2sg | PI-2sg |

- (c) Stress falls on the traditional theme vowel → final syllable  
 kən-'tem      kən-'ta      sur-'tis  
 PI/PS-1pl      SP-3sg      IS-1/3sg
- (d) Stress falls on the traditional theme vowel → penultimate syllable  
 kən-'ta-bəm      u-'ni-əw      sur-'ti-siz  
 II-1pl      II-2pl      IS-2sg
- (e) Stress falls on the inflection ending → final syllable  
 kən-tə-'rəm      sur-ti-'ran  
 F-1pl      F-3pl
- (f) Stress falls on the inflection ending → penultimate syllable  
 kən-tə-'ri-əm      sur-ti-'ri-əz  
 C-1pl      C-2sg

Mascaró (1983, 1986) accounts for these facts with the array of assumptions stated in (100), and a Stress Deletion Rule that deletes all underlying stresses except the rightmost.

- (100) (a) Roots have underlying stress on the last syllable
- (b) Theme vowels (suffix -εʃ- included) have underlying stress
- (c) Some inflectional morphemes have underlying stress: F and C
- (d) Some inflectional morphemes have no underlying stress: II, PS, SP, IS, PI.

More recent approaches to Catalan verbal inflection continue to assume that stress is lexical, hence present in the underlying representation, as Sifre (1995).<sup>55</sup>

On the other hand, Burzio and DiFabio (1997) propose an analysis of Italian *-isc-* based on the puzzling array of assumptions stated in (101), and the principle transcribed in (102).<sup>56</sup>

<sup>55</sup> Concretely, Sifre (1995:329) claims that the traditional theme vowel is 'un formatiu tònic', i.e. a stressed constituent.

<sup>56</sup> They deal with other issues related to stress. I will just concentrate on their analysis of *-isc-*, since as far as I can tell, this suffix behaves in exactly the same way as Catalan *-εʃ-*. The only difference between Catalan and Italian with respect to the third conjugation is that in Italian it is no longer productive (Serianni (1997)).

- (101) (a) Some roots have underlying stress
- (b) Some roots have no underlying stress
- (c) Some inflectional affixes have underlying stress
- (d) Some inflectional affixes have no underlying stress
- (e) -isc- has underlying stress
- (f) There is a distinction between *essential* and *inessential* morphemes

(102) Accentual Stability (p.22)

Morphemes maintain fixed accentual properties in word-formation

In what follows, to the extent that it is relevant for our analysis, I briefly summarize Burzio & DiFabio's (1997) account of the appearance of the suffix *-isc-* in some forms of some verbs but not in others (the same forms as in Catalan: singular forms and 3pl of the present tense), and in some verbs, but not in others. I exemplify their analysis with their examples in (103).

- (103) (a) *fin-í-re* / *fin-í-sc-o* / *fin-iámo* 'to finish / I finish / we finish'
- (b) *part-í-re* / *párt-o* / \**partísco* 'to leave / I leave'

The difference between these two types of verbs lies in their underlying form: while the root /*fin-*/ is unstressed, the root /*párt-*/ is stressed. According to Burzio & DiFabio's proposal, the absence of the infix *-isc-* in the *finire*-type forms follows from the principle stated in (102): "in those cases, since the main stress falls on the next syllable, stress on *isc* would result in a "stress clash" [ ]. Hence, *isc* would be forced to be stressless and hence inconsistent with [(102)]. It is thus suppressed to avoid metrical inconsistency" (p. 24). In the case of *partire*-type verbs, the bad forms are excluded because the stress of *-isc-* would clash with that of the stem. However, in the infinitive [*partíre*], there is a 'stem-remetrification' (p. 27). The fact that *-íre* but not *-ísc-* can remetrify the stem is due to the fact that the former is *functionally essential* while the latter is *inessential*.



On the one hand, Burzio & DiFabio's (1997) account is rather circular and leads to a cyclicity problem. In order to know whether *-isc-* can be inserted or not in the *finíre*-type verbs (the vast majority among the third conjugation verbs, as in Catalan), one needs to know first whether the following inflectional suffix is stressed or not. On the other hand, these accounts (Mascaró's, Sifre's and Burzio & DiFabio's) need to assume arbitrary underlying stress.

I claim that stress is fully predictable in the verbal environment.<sup>57</sup> Hence, these prior analyses fail to account for this generalization, which follows from the analysis I have proposed, as will be shown in what follows.

The analysis is developed within the theoretical framework of Halle & Idsardi (1996). In this approach, stress is computed on a separate plane, the metrical plane onto which all and only the stress-bearing phonemes of strings are projected. In Catalan, I propose the rules stated in (104) for stress assignment in verbal environments. Thus, on the metrical plane, the stress-bearing units, i.e. vowels, project an abstract mark into line 0. The functional head T projects a right parenthesis to its left. The rightmost element on line 0, the head, projects an abstract mark into line 1.

- (104)        Line 0:
- a. Each vowel (syllable head) projects an abstract mark.
  - b. The T node projects a right boundary to its left (the left of the phonological exponent realizing T(/AGR) ).
  - c. The rightmost element of each constituent on line 0 (the head) projects an abstract mark onto line 1.

In the next subsections, I illustrate how the analysis works with some examples. It is important to bear in mind that when stress is assigned we will have a three-plane structure, namely, the syntactic structure, the phonological string and the metrical plane. Recall that in some cases, T will have fused with Mood or Agr, in others the terminal node T will have been deleted, and still in other cases it will be realized as a single node.

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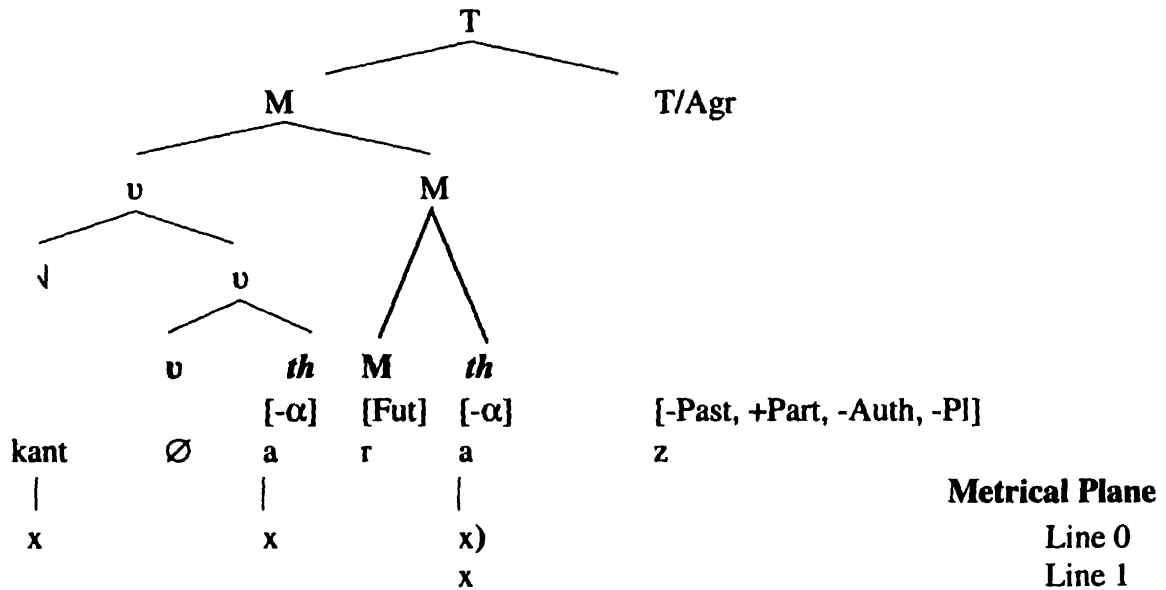
<sup>57</sup> There are only some forms (the subjunctive forms) of two verbs, *saber* 'know' and *caber* 'fit' that remain outside of this generalization. Since they are idiosyncratic, I leave them aside.

### 5.1. Future and Conditional

For all verbs, in the future, stress falls on the last syllable, while in the conditional, stress falls on the penultimate syllable.

As shown in (105), in the future, T and Agr have fused into one morpheme, so that when T projects a right boundary to its left on the metrical plane, stress is assigned to the theme vowel taken by the M node.

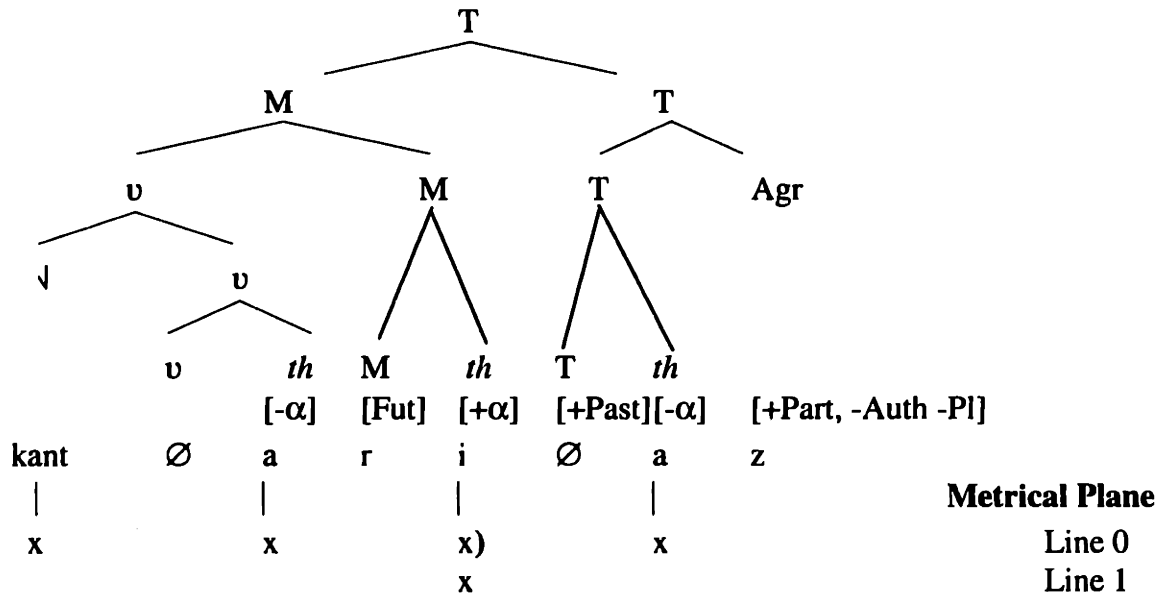
(105) [kəntər'as] 2sg Future



For the first and second person plural, where T has been impoverished, we get the same right results (see the present tense forms, where the same structure is obtained).

In the conditional, in (106), since T and Agr do not fuse because of the presence of a [+Past] feature, T takes a theme vowel. When T projects on the metrical plane, stress falls on the same vowel as in the future, i.e. the theme vowel taken by the M node. However, in this case, the fact that T itself takes a theme vowel, results in stress on the penult.

(106) [kəntər'ias] 2sg Conditional

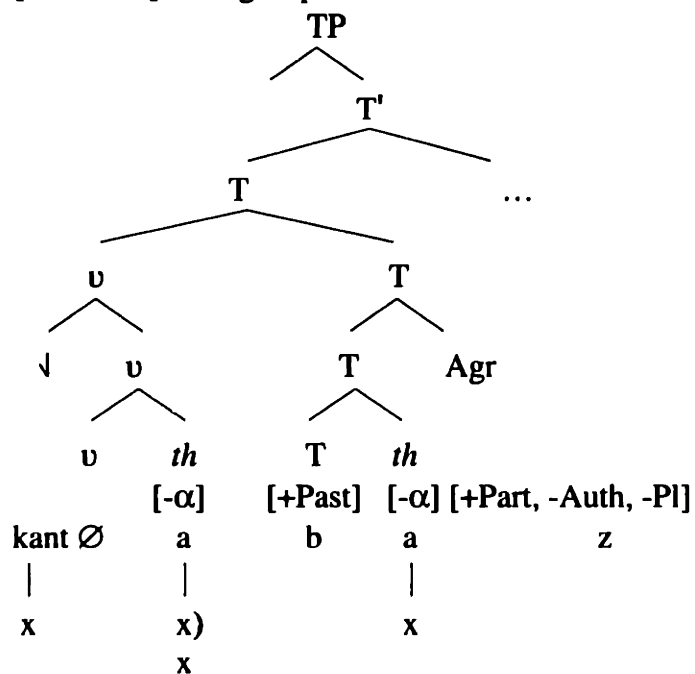


Thus, in both future and conditional tenses, stress falls on the same theme vowel, the one that immediately precedes T. This is independent of the features of the theme as well as of whether this theme vowel is the last one in the string or not.

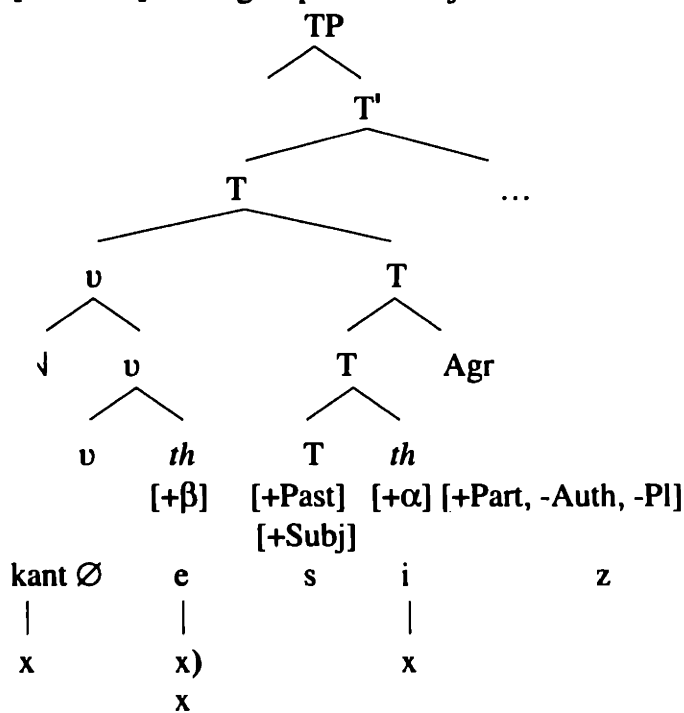
## 5.2. Past Tense

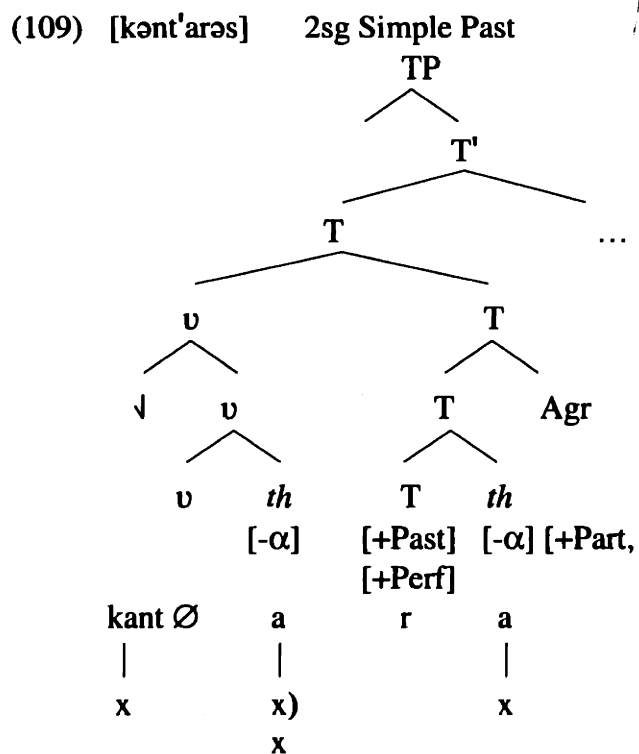
For all verbs, in the past tenses stress falls on the traditional theme vowel, i.e. in our analysis the one selected by *v*. This is because for all conjugations, the stress-bearing unit immediately preceding the [+Past] tense morpheme is the traditional theme vowel. This is shown in (107)-(109).

(107) [kənt'abəs] 2sg Imperfect Indicative

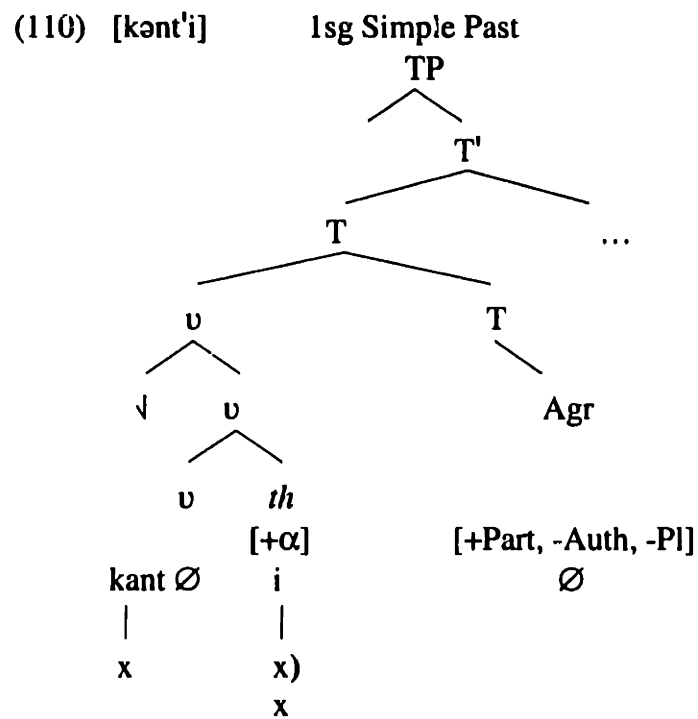


(108) [kənt'esis] 2sg Imperfect Subjunctive



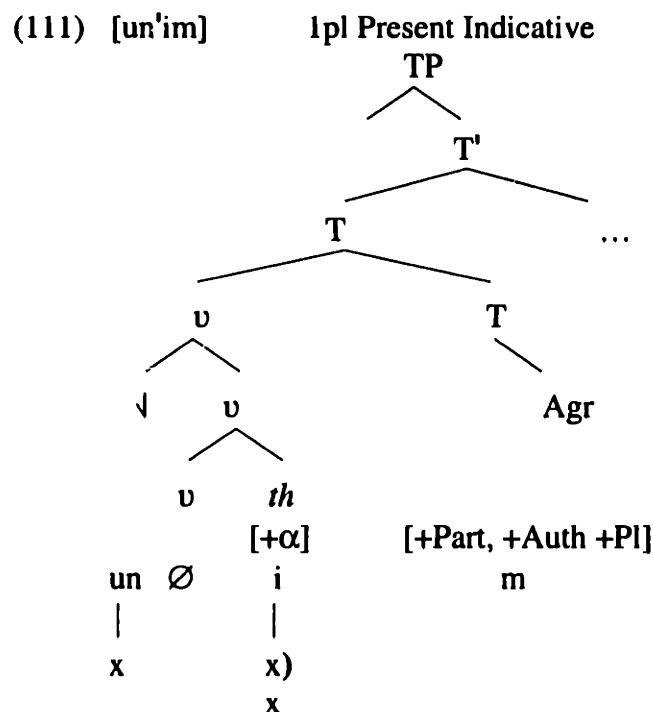


Recall that for the first and third person singular of the Simple Past, we proposed a rule that impoverishes the T node that is sister of Agr. Moreover, in the first person, the final vowel is neutralized for all conjugations. In the discussion of these forms, I claimed that this final vowel must be considered as a theme vowel for stress reasons. This is shown in (110) below. The /i/ that appears in all conjugations can only be the theme vowel immediately preceding T, i.e. the theme vowel taken by u.



### 5.3. Present Tense

In the first and second person plural, stress falls on the theme vowel, which is always final. This is shown in (111) for the verb *unir*. In this case, although the T node that is sister of Agr has been deleted, the higher T node is still available in the structure to project a right bracket on the metrical plane.

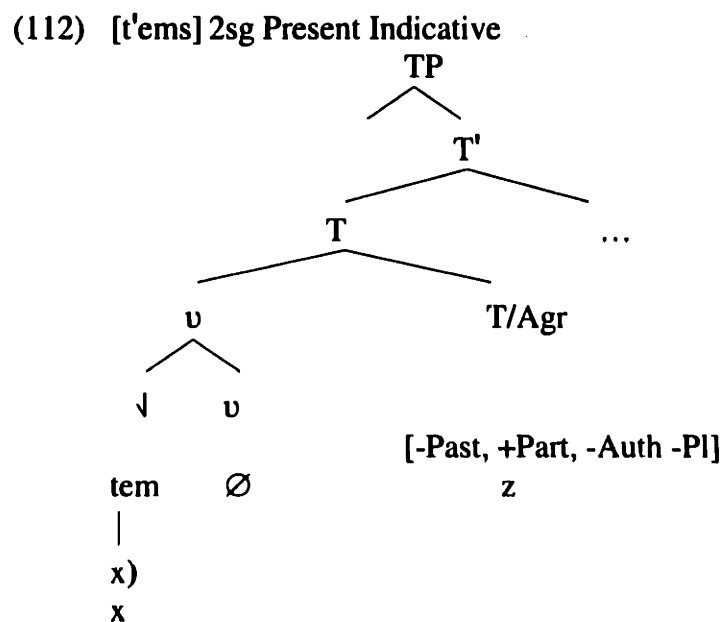


**Metrical Plane**

Line 0

Line 1

In the other forms, we find a contrast in stress among conjugations. For the second conjugation and *sortir*-type verbs, since the theme vowel taken by *v* has been deleted, stress falls on the root, which is the next available stress-bearing unit to the left of *T*. This is shown in (112) for the second conjugation verb *témer*.



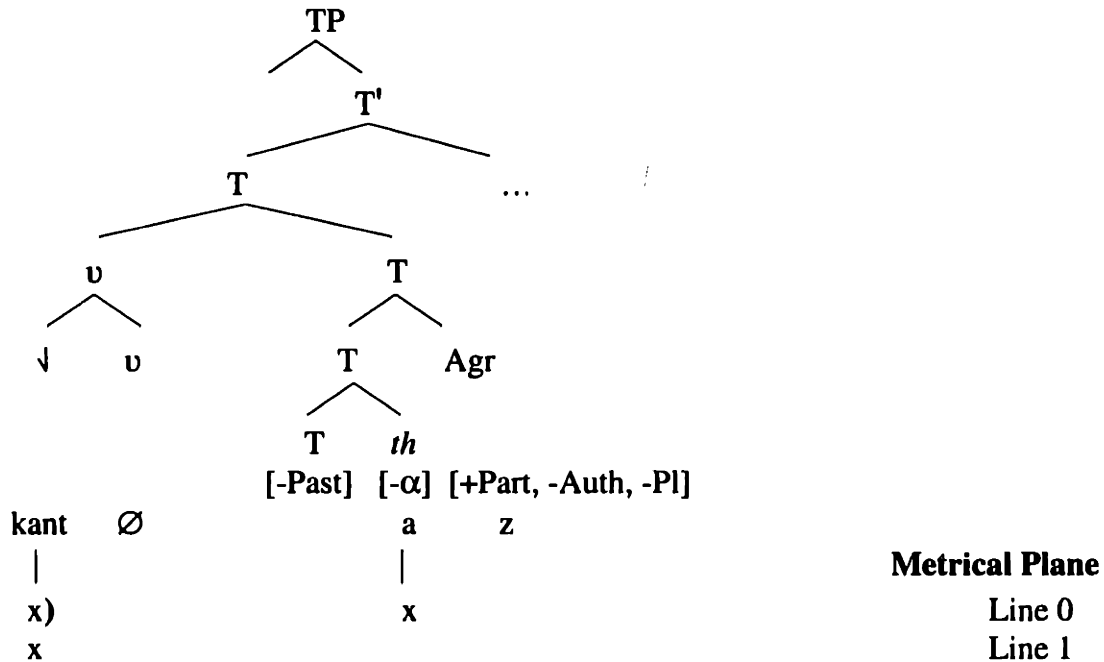
**Metrical Plane**

Line 0

Line 1

For the first conjugation, recall that I assumed that in this case T and Agr do not fuse, so that T takes a theme vowel. Therefore, although stress falls in the same position as in (112) above, these forms have penultimate stress, as shown in (113).

(113) [k'antəs]      2sg Present Indicative



It also follows from our analysis of stress that the /a/ preceding the agreement morpheme in /kant-a-z/ cannot be the theme immediately following the root. If it were, it would be stressed. There is one verb in the whole paradigm with a stressed theme in this position in the present, the verb *estar* 'to be (=to stay)' that has the present indicative forms shown in (114).

(114) əst'ik      əst'as      əst'a      əst'em      əst'ew      əst'an

These forms clearly contrast in the position of stress with the present tense forms of *cantar* repeated in (115) below.

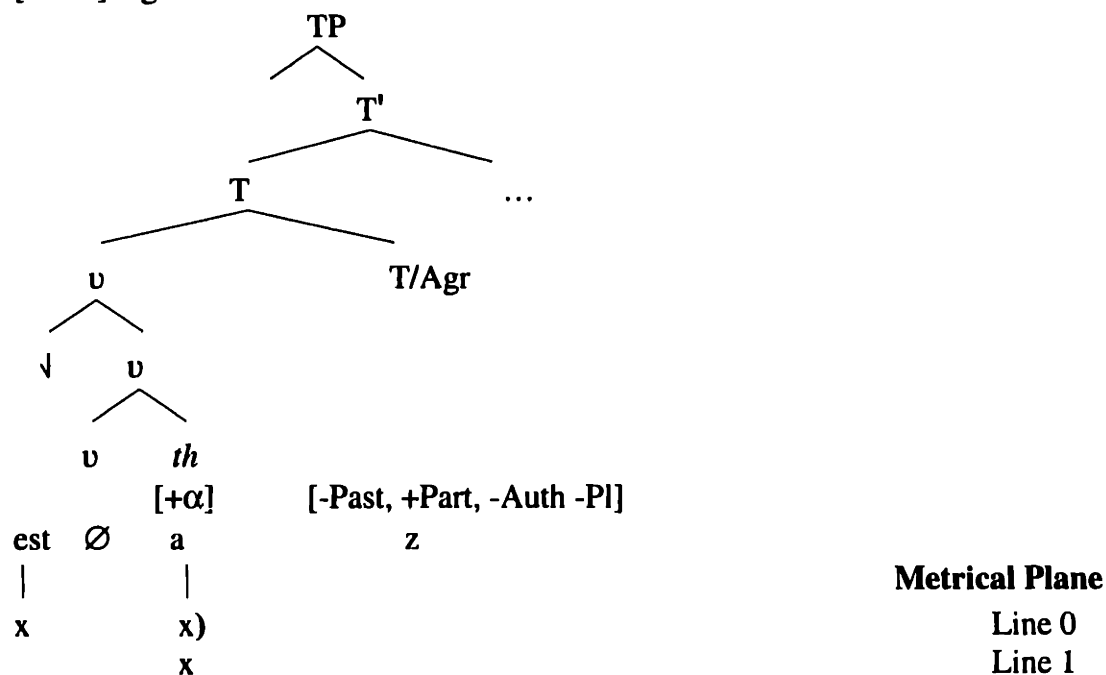
(115) k'antu      k'antəs      k'antə      kənt'em      kənt'ew      k'antən

For the verb *estar*, which shows other irregularities as well, our analysis predicts that the stressed vowel is the theme vowel realized in *u*. Notice that, except for the first



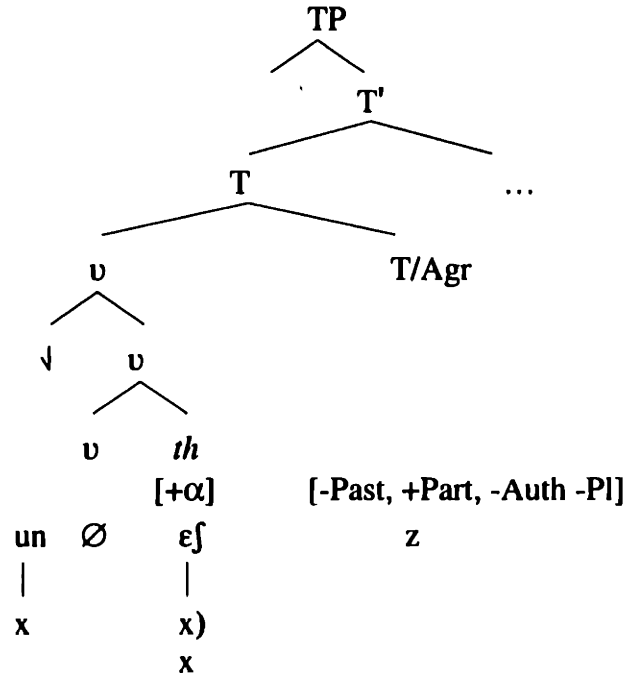
person singular, the verb *estar* actually looks like a 'well-behaved' verb in our proposal. That is, T and Agr fuse in the unmarked environment, and a theme is realized in v (without the application of the Impoverishment rule 2 in (84)). This is illustrated in (116).

(116) [əst'as] 2sg Present Indicative



Interestingly, in the third conjugation, stress falls on the root for *sortir*-type verbs, as in (112) above, but it falls on the /ɛʃ/ theme vowel for *unir*-type verbs. Notice that this follows without any other extra assumption or stipulation. Since /ɛʃ/ is the theme vowel immediately preceding T, it receives stress, as shown in (117).

(117) [un'ɛʃəs]      2sg Present Indicative

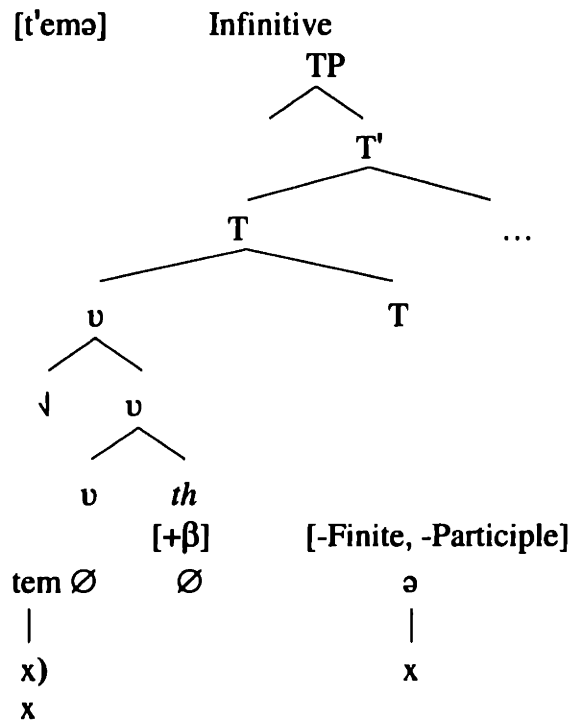


#### 5.4. Non-finite forms

In the majority of second conjugation verbs, e.g. *témer* or *batre*, stress falls on the root in the infinitive. Again, this simply follows from our analysis and from our Vocabulary entries,<sup>58</sup> since the stress-bearing unit immediately preceding T is the root vowel in these cases. This is illustrated in (118).

<sup>58</sup> Recall that second conjugation verbs have a specific Vocabulary item realizing the feature [+β] in the context of a [-Participle] T node.

(118) [t'emə]



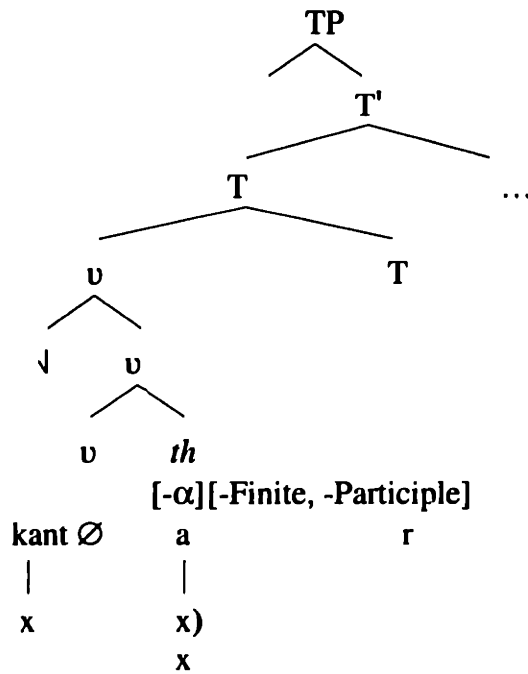
There are some exceptions to the above generalizations among the irregular verbs that take a theme vowel, in which case, as predicted by our analysis, stress does not fall on the root, but on the theme, as shown in (119) below. For the other conjugations, in the infinitive, stress falls on the theme vowel without exception.

(119) səb-'ε-r      əb-'ε-r      bul-'ε-r      bəl-'ε-r      pud-'ε-r  
'know'      'have'      'want'      'be worth'      'be able'

In the infinitive forms of all other verbs, and in the other non-finite forms for all verbs, stress falls on the theme vowel, hence on the last syllable, as depicted in (120)-(122).

(120) [kənt'a]

Infinitive



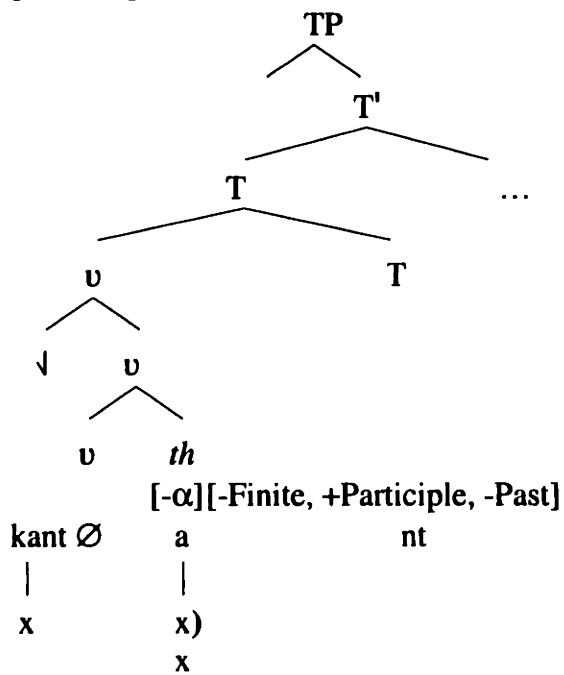
**Metrical Plane**

Line 0

Line 1

(121) [kənt'ant]

Gerund



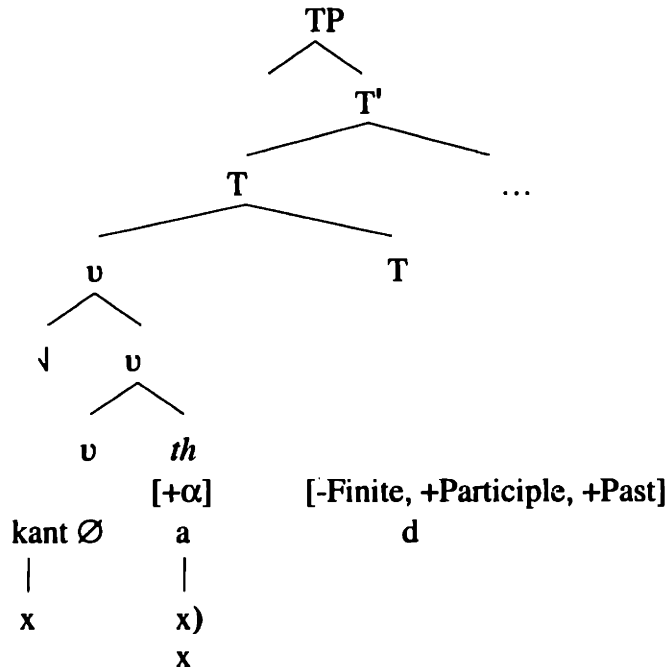
**Metrical Plane**

Line 0

Line 1

(122) [kənt'at]

Participle



Metrical Plane

Line 0

Line 1

## 6. Towards a Full Account of Catalan Morphophonology

This paper is primarily devoted to the analysis of Catalan verbal morphology, and it would go far beyond the main goal of this research to provide a complete account of the entire morphophonology of Catalan. However, the proposals contained in the previous sections do have consequences far beyond the Catalan verbal system. In this section I will state those implications for the non-verbal morphology and will attempt to provide a first approximation for the analysis of these issues.

In the previous section, we have proposed an analysis of stress assignment for verbs that we would like to make compatible with the other words in the language. It is often assumed that in Catalan the principles that govern the stress assignment in the verbal environment are different from the ones governing stress assignment in non-verbal environments, i.e. for nouns, adjectives, and adverbs.<sup>59</sup> The difference comes mainly

<sup>59</sup> See for instance Bonet & Lloret (1998: chapter 8). This is also assumed for Spanish in Harris (1995), among others. I will not make any claims about stress assignment in Spanish or any other Romance language at this point as the object of inquiry of this analysis is Catalan. Nonetheless, I am certain that the essence of this analysis can be profitably extended to other Romance languages. That is, it will be worth looking at the stress facts in other Romance languages from the perspective that I am proposing here, since I think that the basic analysis holds in the other Romance languages as well, and it may shed some light into the numerous puzzles that stress has posed for phonologists. I will leave the other Romance languages for further research.

from the claim that stress in the verbal environment is quantity-insensitive, while it is quantity-sensitive for nouns, adjectives and adverbs.

Now, in this analysis, stress is a realization of a functional projection. Therefore, we have argued against the postulation of underlying stress in the verbal environment. In our analysis, this means that roots have no underlying stress. But as we know, we can form verbs or nouns or adjectives out of the same roots, as shown in (123).

|           |        |                            |                         |
|-----------|--------|----------------------------|-------------------------|
| (123) (a) | ɟkant  | kənt'ar<br>'to sing'       | k'ant<br>'song/singing' |
| (b)       | ɟun    | un'ir<br>'to join'         | uni'o<br>'joining'      |
| (c)       | ɟnɛgr  | ənnəgr'ir<br>'to blacken'  | n'ɛgrə<br>'black'       |
| (d)       | ɟməkin | məkin'ar<br>'to machinate' | m'akinə<br>'machine'    |

In the context of Tense, those derived words, i.e. verbs, will be assigned stress by the rules stated in the previous section. An immediate question arises, namely how is stressed assigned to the same roots in other configurations, i.e. where there is no T? It is clear that we do not want to have duplicate roots specified for appearance in one context or the other, depending on the presence versus absence of underlying stress.

Now, if the analysis that we have developed here for verbs is on the right track, we expect that in nominal, adjectival and adverbial environments some functional head projects a boundary on the metrical plane, as T does in the verbal environment. Furthermore, given our well-formedness condition on functional heads, if such functional heads exist in the non-verbal environment, we expect them to be subject to that requirement in a non-trivial way. The next subsection is devoted to showing that these two predictions of our analysis are borne out in non-verbal environments.

### **6.1. Theme Vowels and Class Markers**

Consider again the nominal forms given in (123) above, repeated in (124). Throughout this work I have assumed that only root morphemes and functional

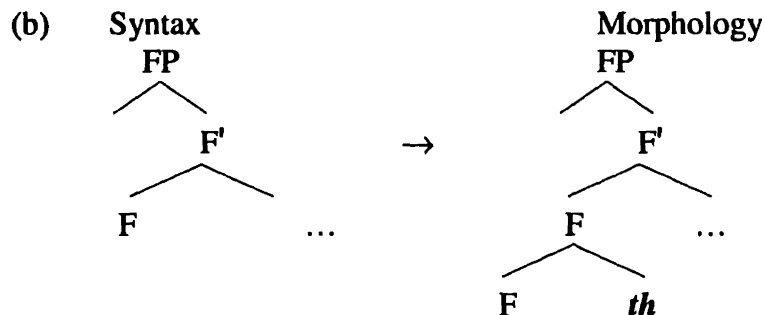
morphemes are listed, and that morphological categories are determined by the syntactic configuration. In the case of verbs, we have seen that a root becomes verbal when it merges with the functional head *v* (and it becomes a verb when it is further *c*-commanded by the functional heads *T*, *M*, *A*). Following Marantz (1997, 1999a, 1999b) I assume that a root becomes a noun or an adjective when it merges with the functional categories 'little *n*' or 'little *a*' respectively.<sup>60</sup> Thus, the root *√kant* becomes a noun when it merges with a functional head 'little *n*', as shown in (125).

(124) *kánt-Ø*      *unió-Ø*      *n'egr-ə*      *mákin-ə*



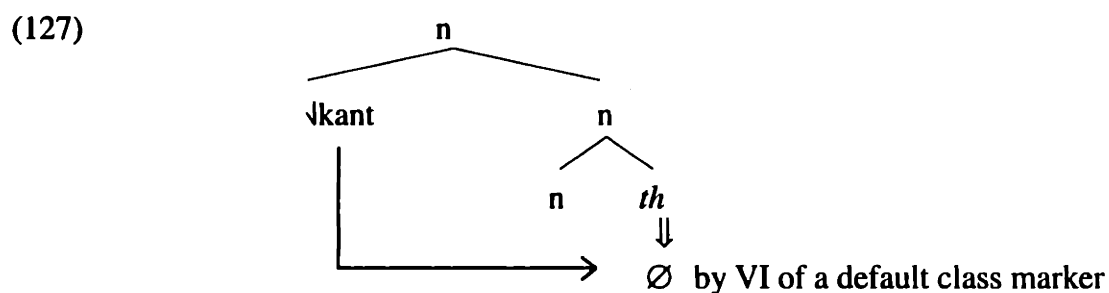
Thus, the first prediction of our analysis is borne out; there is a functional head 'little *n*' (or 'little *a*' ) in the nominal environment that will perform the same job as *T* does for verbs with respect to stress. But before entering into the discussion of stress assignment in non-verbal environments, let us consider the second prediction of our analysis. Recall our well-formedness requirement on functional heads, repeated in (126) below.

(126) (a) Morphological well-formedness condition on *F*<sub>0</sub>'s  
Every non-defective *F*<sub>0</sub> requires a theme position



<sup>60</sup> I will exemplify the implications of our analysis in the non-verbal environment with nouns and adjectives and leave aside adverbs.

This condition requires that *every*  $F_0$  takes a theme position. That is, it does not say that it only applies in the verbal environment. Hence, it will apply in the structure in (125) above. An immediate question arises, namely what is inserted in that theme position? I propose that in non-verbal environments this position is filled by the so-called *class markers*.<sup>61</sup> That is, under this analysis, verbal *theme vowels* and non-verbal *class markers* are unified as both being the result of a well-formedness condition on functional heads. Thus, in the morphology, the structure in (125) undergoes the application of this requirement resulting in the structure in (127).



Let us now come back to the question of stress assignment in these environments.<sup>62</sup> Consider the forms in (128), where we find a three way contrast: a noun that has antepenultimate stress, and two verbal forms, infinitive and present tense, with stress on the final and the penultimate syllables respectively.

|       |         |                  |            |                     |
|-------|---------|------------------|------------|---------------------|
| (128) | ɤfabrik | [fəbrɪk'a]       | [f'abrikə] | [fəbr'ikə]          |
|       |         | 'to manufacture' | 'factory'  | 's/he manufactures' |

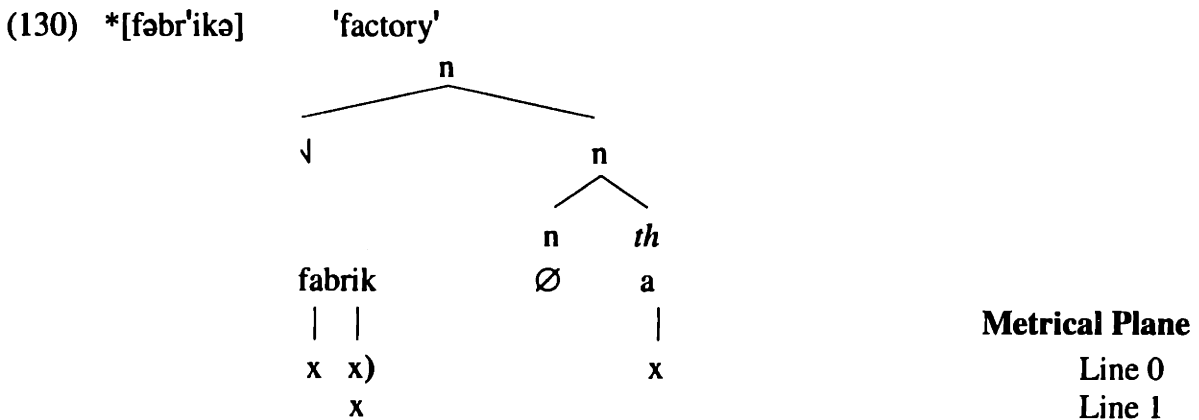
Assuming that the root has no underlying stress, we can account for the assignment of stress in the two verbal forms but not for the stress on the noun. According to our proposals we would incorrectly obtain the form [fəbr'ikə], rather than [f'abrikə] as shown in (130). That is, extending our stress rule above as in (129), 'little n' projects a right boundary to its left on the metrical plane.

<sup>61</sup> See Harris (1991) for the notion of class marker in Spanish. Here, I don't intend to provide a complete analysis of Catalan class markers. My intention is to demonstrate that our proposal for verbs extends far beyond the scope of verbal morphology, in that it unifies two as yet unrelated notions, to provide a first approximation to a unified analysis of stress. Thus, I leave the details of the different class markers for further research.

<sup>62</sup> The analysis that follows must be understood as a first approximation towards a unified account of stress assignment in Catalan.



- (129) Line 0:
- a. Each vowel (syllable head) projects an abstract mark.
  - b. A functional head (T, 'little n' or 'little a') projects a right boundary to its left (the left of the phonological exponent realizing T, n, a ).
  - c. The rightmost element of each constituent on line 0 (the head) projects an abstract mark onto line 1.



Thus, it is clear that some roots must have underlying stress. The question now is whether we can make this compatible with our proposals. The key point is that these and other examples show that idiosyncratic stress, i.e. underlying stress is not preserved in the verbal environment in Catalan.<sup>63</sup> To account for this fact, I propose the constraint given in (131), which will only be active in non-verbal environments. Moreover, I propose the extension to our stress rule as in (132).

(131) Avoid )\*) (in the non-verbal environment only)

(132) Stress Rule (extended)

- Line 0:
- a. Each vowel (syllable head) projects an abstract mark.
  - b. A functional projection (T, n, a) projects a right boundary to its left (the left of the phonological exponent realizing T, n, a ).

<sup>63</sup> Consider, for instance, the same words in Italian.

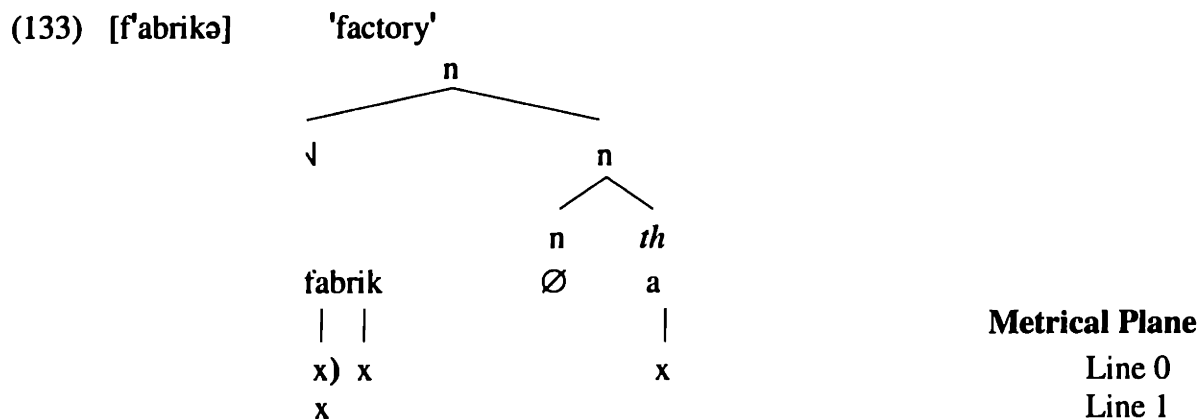
(i) [f'abrika] [f'abrika] [fabrik'are]  
'factory' s/he manufactures 'to manufacture'

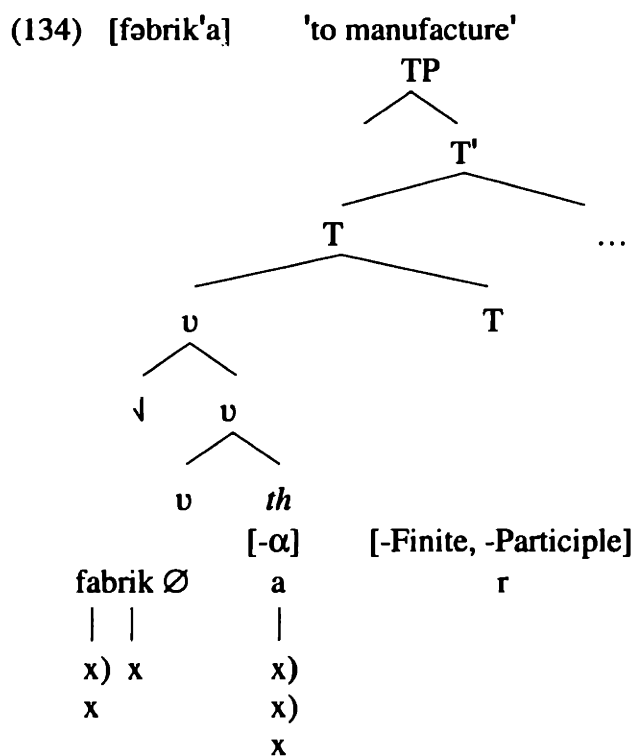
By comparing these data to the Catalan ones above, it seems clear that Italian preserves 'lexical' stress in verbal environments, while Catalan doesn't. The crucial example here, as it will be shown shortly, is the third person singular form of the verb.

c. The rightmost element of each constituent on line 0 (the head) projects an abstract mark onto line 1.

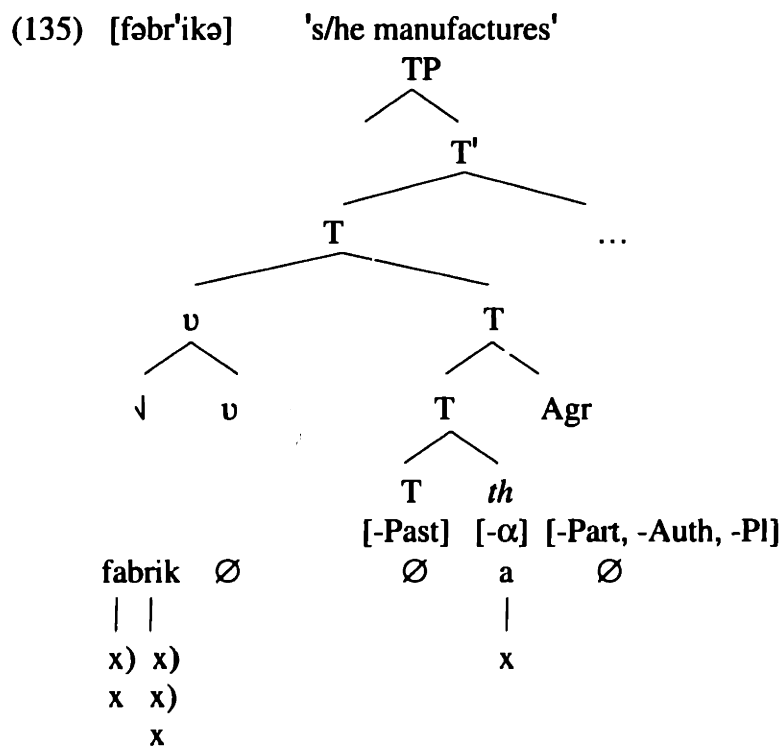
- Line 1:
- a. A right boundary is inserted to the right of the rightmost element.
  - b. The rightmost element of the constituent on line 1 (the head) projects an abstract mark onto line 2.

In (133)-(135), I show the derivation for the three forms derived out of the same root  $\downarrow$ fabrik. In (133), the root is merged with 'little n'. In the morphology, a theme position is adjoined to this functional head by our well-formedness requirement on  $F_0$ , into which a Vocabulary item /a/ will be inserted by VI. On the metrical plane, the projection of a metrical boundary by the functional head 'little n' is banned by the constraint in (131) above, i.e. the underlying stress is preserved. In (134), on the metrical plane T projects a metrical boundary onto line 1. Since line 1 heads are defined by a right boundary on line 1, we obtain the right result. Crucially, in (135), although the projection of a boundary by T violates the constraint in (131), it is not banned because it is in verbal environment.





Line 0  
Line 1  
Line 2



Line 0  
Line 1  
Line 2

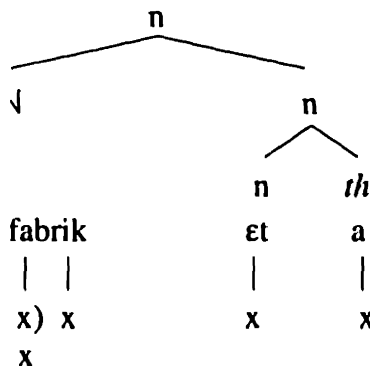
Now, consider the examples in (136). For the noun 'gender' we have the same derivation as for the noun 'factory' above. However, the adjective 'generic' seems to violate our constraint on stress preservation in non-verbal environments. As Mascaró

(136)  $\downarrow$ g'ener                      [g'ener-ə]                      gen'er-ik-Ø  
                                                 'gender'                                      'generic'

The diagram shows a root node 'a' branching into two nodes. The left node is '√' (a checkmark), which branches into 'g'ener' and 'x'. The right node is 'a', which branches into 'ik' and 'th'. Below 'g'ener' is 'x', and below 'ik' is 'x'. The final output is 'g'ener'ik'.

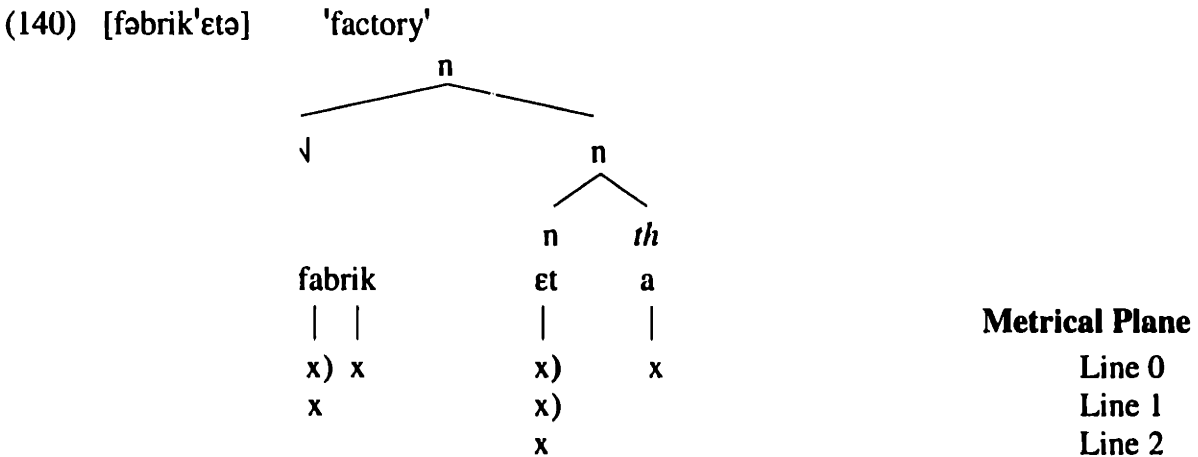
(138) [fəbrik'etə] 'small factory'

(139) \*[f'abrikətə] 'factory'



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This and many other similar examples suggest that the functional projection 'little n' (or 'little a') projects a right boundary to its *right*. This would provide the correct result for [fəbrik'etə], as shown in (140).



For the analysis of stress in the verbal environment, we proposed that T projects a right boundary to its left. This choice was not arbitrary. Recall that for the second conjugation verbs like *témer* the infinitive morpheme is realized by the Vocabulary item /ə/. This is the only case where the *ı* node (or the fused node T/Agr) is realized by a vowel, i.e. a stress-bearing unit. In this case, if the T node were to project a right boundary to its right, stress would mistakenly be assigned to the vowel realizing the tense morpheme.

Now, there are two possible solutions to this issue. We can either propose a single stress rule, according to which a functional head (T, n, or a) projects a right boundary to its *right*. In this case, we should have to review our analysis of the second conjugation infinitivals.<sup>64</sup>

Or, we can propose two rules applying in different environments, thus keeping our rule for the verbal environment as stated in (104) in the previous section; the stress rule in (141) would account for stress assignment in the non-verbal environment.

(141) Line 0:            a. Each vowel (syllable head) projects an abstract mark.

<sup>64</sup> Notice that we could easily argue that an underlying schwa is not a stress-bearing unit, i.e. that it does not project on the metrical plane.

- b. A functional projection (n, a) projects a right boundary to its right (the left of the phonological exponent realizing T, n, a ).
- c. The rightmost element of each constituent on line 0 (the head) projects an abstract mark onto line 1.

- Line 1:
- a. A right boundary is inserted to the right of the rightmost element.
  - b. The rightmost element of the constituent on line 1 (the head) projects an abstract mark onto line 2.

Although the first solution seems preferable to me because it is more economical, I will leave this question open for the moment. However, notice that either choice will provide support to our claim that stress is fully predictable for verbs and to a large extent for nouns.

## **7. Concluding Remarks**

In this work, we have examined the internal constituent structure of Catalan verbal forms by focussing on the problems posed by the allomorphy of the theme vowel and the allomorphy of the inflectional affixes. I have proposed an analysis within the framework of Distributed Morphology that avoids the cyclicity problems that originally led me to investigate these data. Furthermore, this analysis accounts for the generalizations that underlie the Catalan verbal system, which crucially depend on the syntactic structure of the verbal forms.

The core of my analysis heavily relies on a new conception of the notion of the theme vowel that results from a well-formedness condition on syntactic functional heads, thus providing empirical support to syntactic word formation. Theme vowels have been reanalyzed as complexes of primitive binary features, which allows us to derive all instances of theme vowels from a minimal set of Vocabulary items. Furthermore, this analysis provides a more natural account of the interrelations among the different conjugations, as well as between the conjugations and the contexts in which they appear, in terms of different degrees of markedness.

In addition, this syntactic approach to Catalan verbal morphology provides the means for a better understanding of the assignment of stress in the verbal environment. I have posited a single rule that accounts for the position of stress in all verbal forms,

namely that T projects a boundary in the metrical plane, resulting in the assignment of stress to the stress-bearing unit immediately preceding T. This analysis neatly accounts for two basic facts of Catalan verbal stress. The first is that stress is fully predictable in the verbal system, which implies that any analysis positing unpredictable underlying stress for all roots will be redundant, i.e. more costly. The second is that the position of stress is unified for all tenses by virtue of the fact that it is directly dependent on the T node. The fact that this follows trivially from our analysis of the constituent structure of Catalan verbs further strengthens our proposal. More importantly, it provides strong evidence for a theory of morphology where word formation is mediated by the syntax.

In addition, I have argued that this analysis provides a new view of the entire morphophonology of Catalan, since it has significant consequences far beyond the verbal system. I have briefly discussed two such implications for the nominal system. On the one hand, this analysis unifies the notion of verbal *theme vowel* with the notion of nominal *class marker* by conceiving of both as the result of a well-formedness condition on functional heads. On the other hand, my proposal shows that stress in Catalan is predictable to a large extent and is the result of a single process in both nominal and verbal contexts. Further implications of this analysis are as yet unknown, however, Harris (1999) has already proposed a new analysis of Spanish nasal depalatalization that is grounded in previous drafts of this new approach to Catalan morphology.

To sum up, this analysis provides a unified account of a great number of previously unrelated phenomena within the entire morphophonological system that follow from a new approach to the notion of theme vowel.

To conclude, I would like to suggest that the basic structures proposed in our morphological analysis, as well as our analysis of stress, should be extended to other Catalan dialects and other Romance languages as well. We leave this for future research.

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